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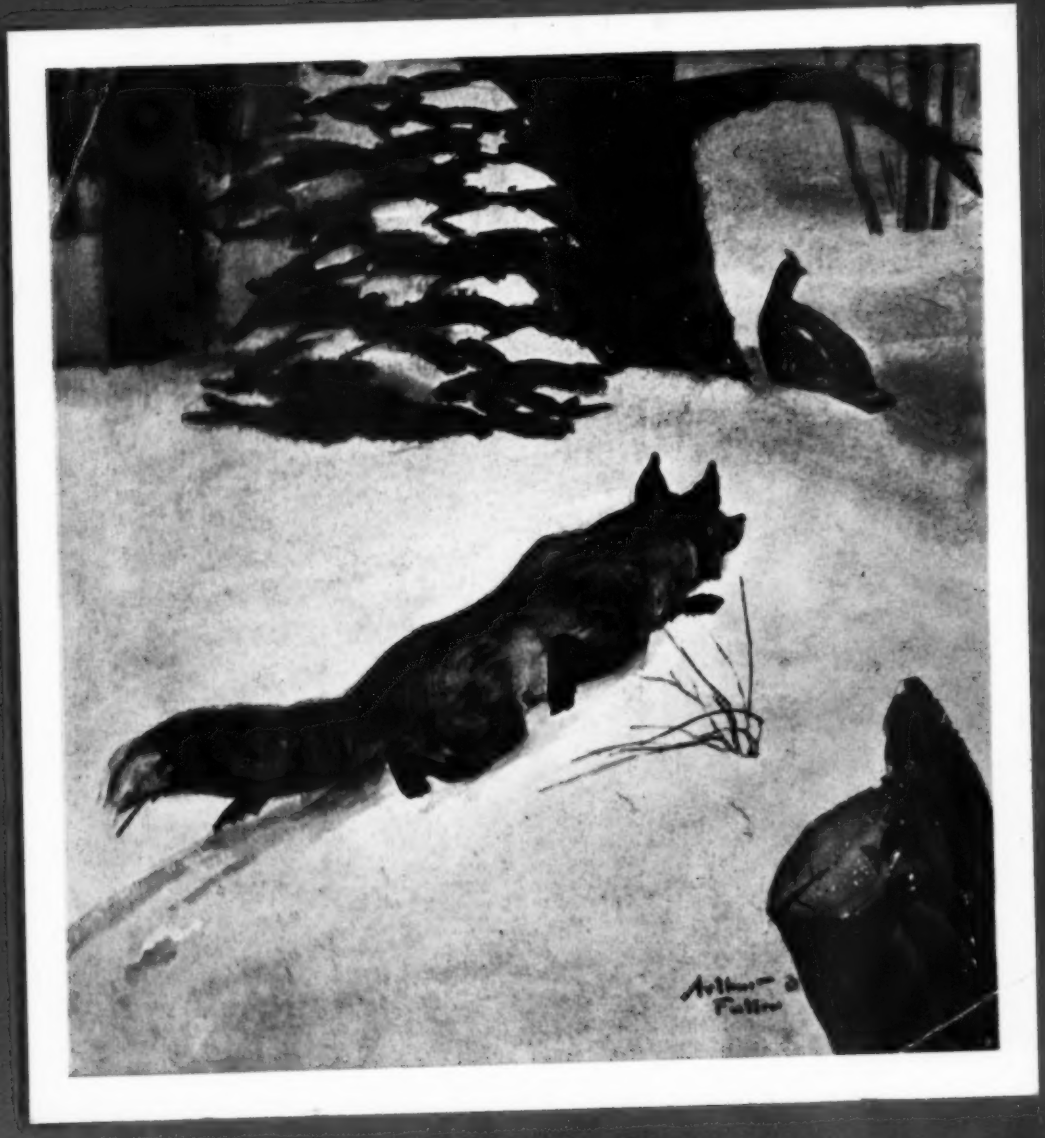

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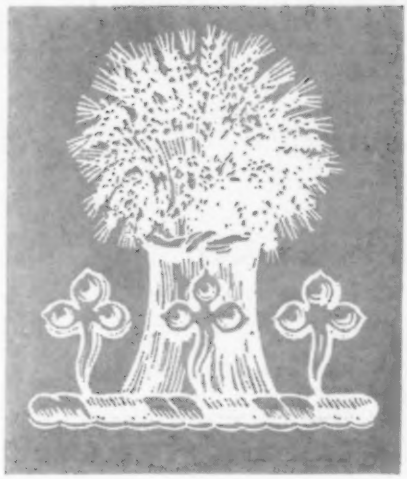

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February 1954. Vol. 74. No. 2.

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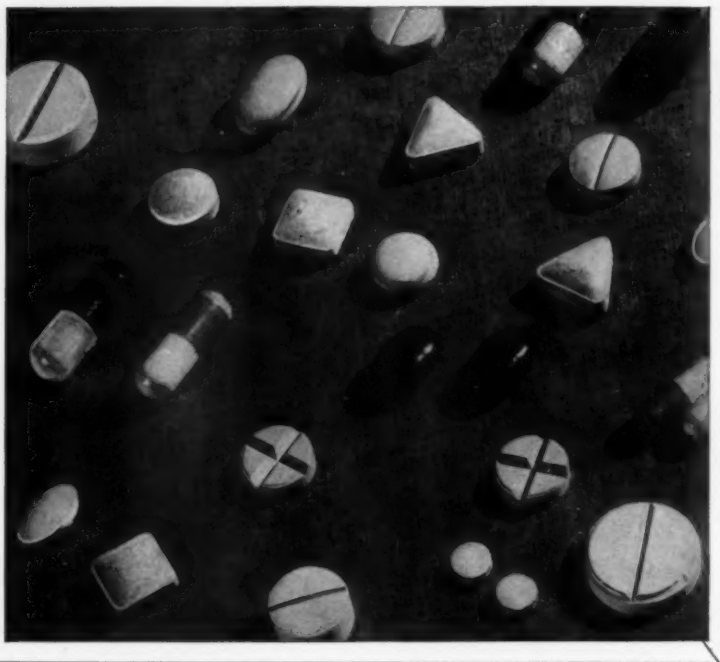

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Since entering the consulting field he has been a contributor to *Drug and Cosmetic Industry*.

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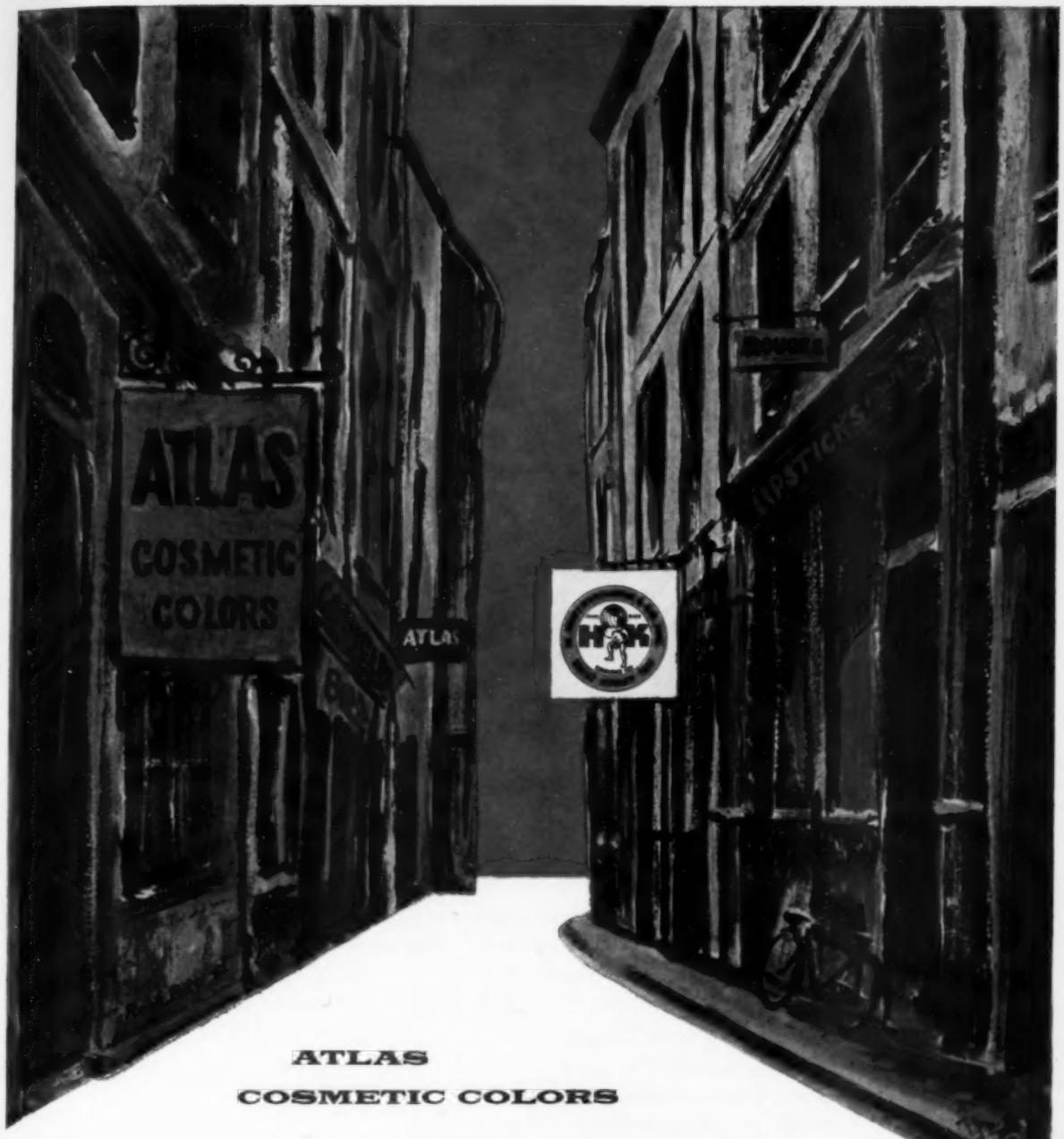

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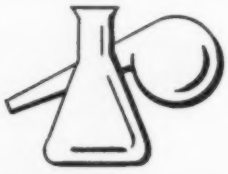
Dr. Otto Jacobi and Miss Gertrude Lantzsch examining subject

Shown here, studying the effects of a cosmetic on the skin surface, blood capillaries and skin temperatures of a subject, are Dr. Otto Jacobi, *right*, and Miss Gertrude Lantzsch, *left*.



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Dr. Jacobi has specialized in skin physiology for 15 years. He studied at the University of Frankfurt am Main—Freiburg, Switzerland—and the University of Giessen, Germany. He is the author of 20 technical papers on the behavior and reaction of normal skin and the influence of cosmetics on normal and sub-normal skin.

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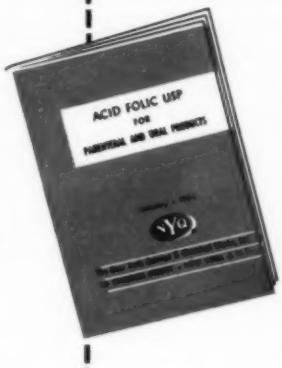

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How Atlas emulsifiers work

In any emulsifier, one portion of the molecule is hydrophilic or water-loving, and another portion is lipophilic or oil-loving. It is this dual nature that enables the emulsifier to accomplish its mission of linking water with oils, fats or waxes, so that these materials can be mixed.

Most Atlas emulsifiers are non-ionic and therefore more insensitive to the presence of electrolytes and hard water than are the ionic types. The Atlas non-ionics are complex esters and ester-ethers derived from hexahydric alcohols (notably sorbitol), alkylene oxide, fatty acids and fatty alcohols. Free hydroxyl and oxyethylene groups supply the hydrophile character of these emulsifiers; the lipophile portion is the long hydrocarbon chain of the fatty acids or fatty alcohols. By combining these raw materials in various ways, Atlas is able to make numerous types and variations of emulsifiers to suit different oil-water conditions.

HLB Determines Emulsifier Behavior

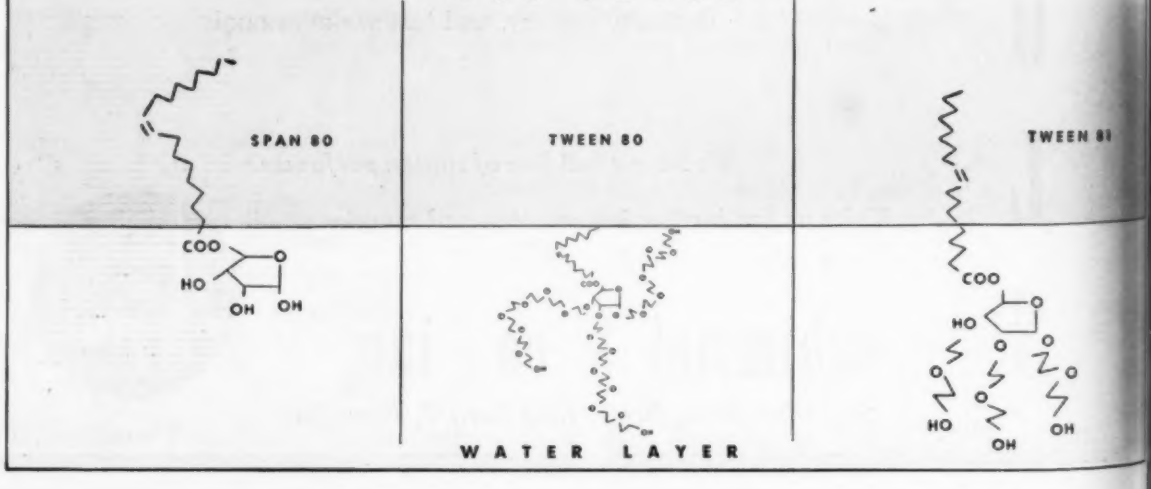
HLB (Hydrophile-Lipophile Balance) is a measure of the strength of the water-loving and oil-loving groups that form the emulsifier molecule. The diagrams below illustrate how this property helps determine the behavior of various Atlas surfactants.

Notice first the action of Span® 80, sorbitan monooleate. The sorbitan portion is not sufficiently water-loving to draw the lipophilic oleic acid chain into the water. Thus, Span 80 is predominantly lipophilic and oil-soluble. It has been assigned a low HLB value (4.3 on the Atlas numerical HLB scale). Span 80 tends to emulsify water in oil.

Tween® 80 demonstrates the opposite action. This type of material is produced by adding polyoxyethylene chains to the Span structure. The accumulation of these chains on the sorbitan portion renders this part of the molecule sufficiently hydrophilic to drag the oleic acid chain completely into the water. Tween 80 is thus hydrophilic and water-soluble, and has been assigned a high HLB number (15.0). Tween 80 tends to give good dispersibility of oil in water.

The third example, Tween 81, is an intermediate type. Here the oil-loving oleic acid chain and the water-loving polyoxyethylene chains are fairly well balanced. The HLB value is intermediate (10.0).

Atlas Technical Service works with emulsion manufacturers on selection of emulsifiers to meet specific requirements.



chemical digest

Clear "solutions" of insoluble oils prepared with Atlas emulsifiers

By means of hydrophilic Atlas emulsifiers, it is possible to prepare sparkling clear emulsions of insoluble oils, such as flavors, scents, medicinals, vitamins and other essential oils. These dispersions have particle size of colloidal dimension—so fine that to the unaided eye they appear just as transparent as true solutions. The difference can be detected by transmitted light tests, as shown in the picture.

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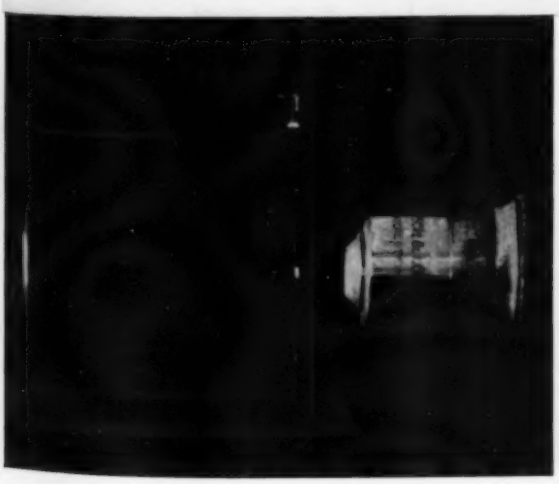
Emulsifiers such as the Tween® products, having a numerical HLB value of 15 to 18, are required for solubilizing. From two to ten parts of emulsifier are used per part of oil. The process is simple. The oil is first dissolved in the emulsifier, and the concentrated solution is then dispersed in water.

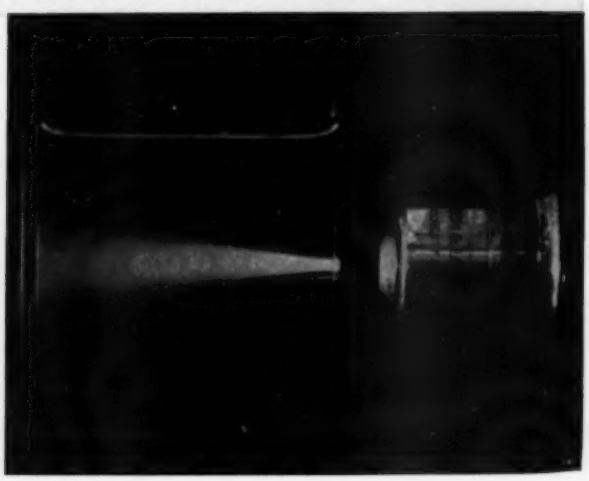
For recommendations on your specific solubilizing application, write or call Atlas.

Both the true solution at the left and the clear emulsion at right prepared with Atlas surfactants appear perfectly transparent.

The true solution gives no reflection of a strong beam of light directed through it.



Characteristic Tyndall Cone effect identifies the presence of colloidal particles in the solubilized oil dispersion.



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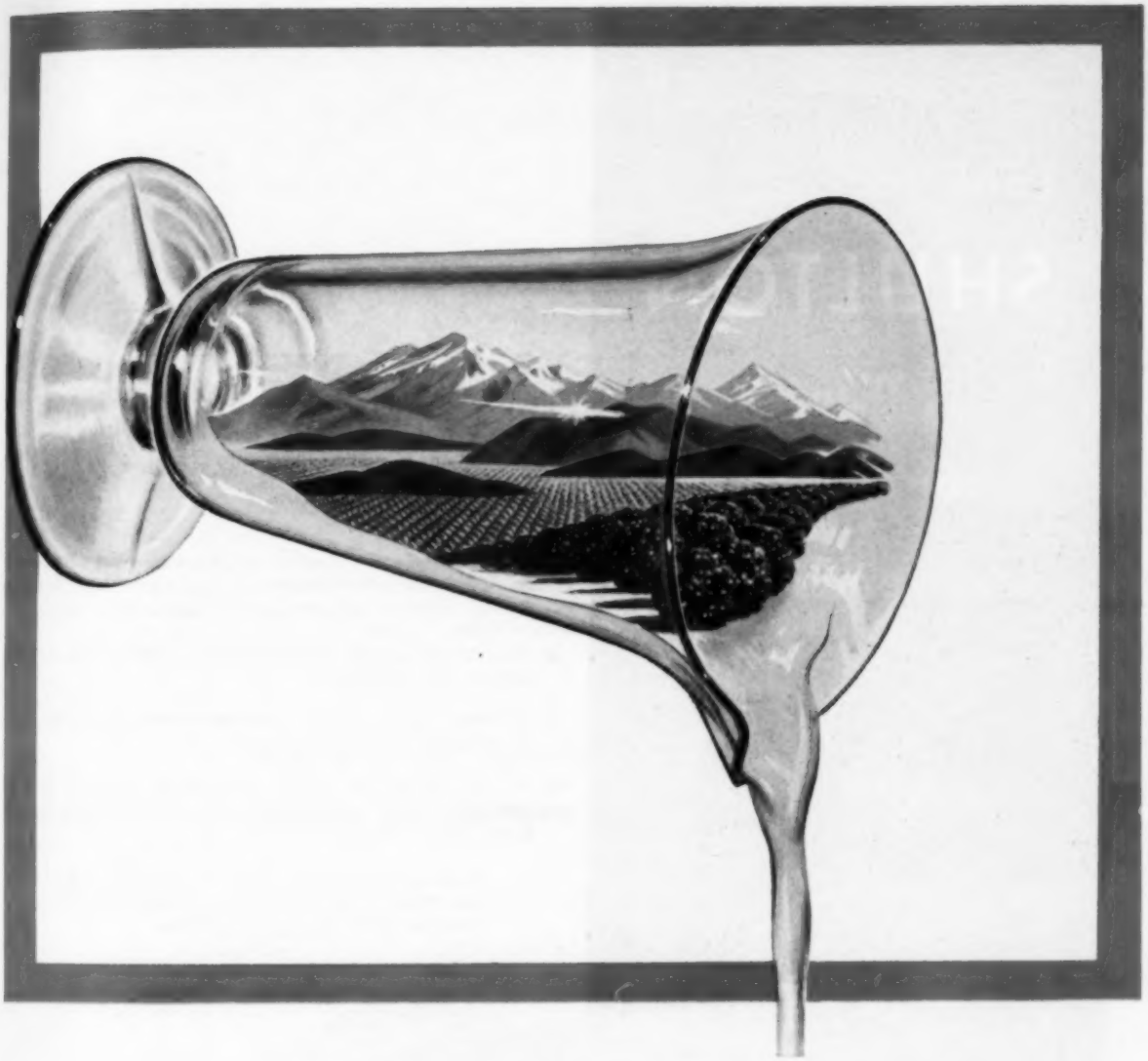

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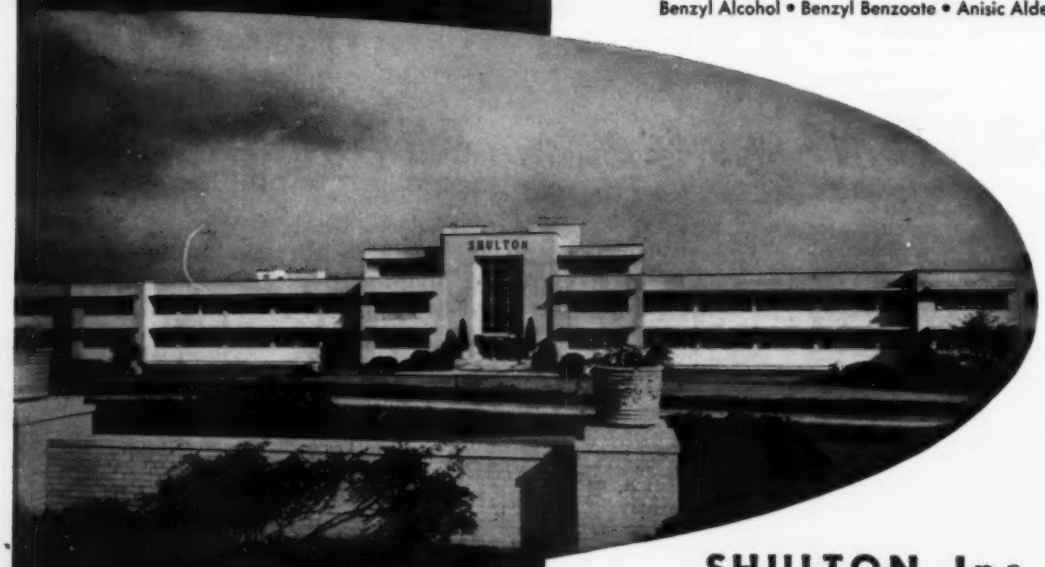

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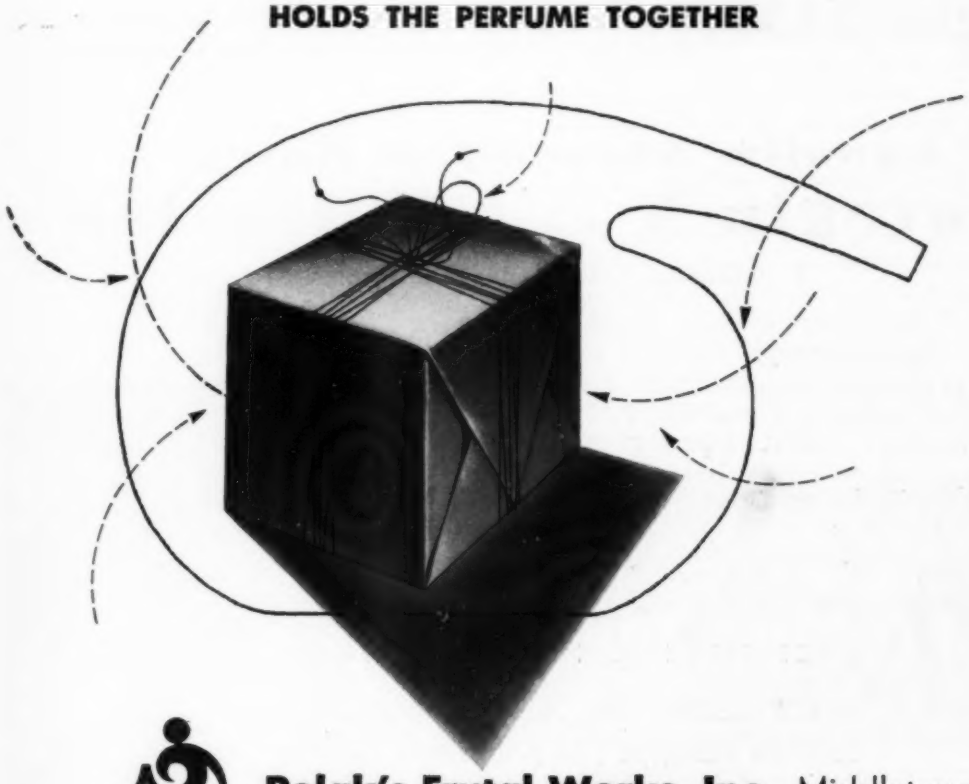

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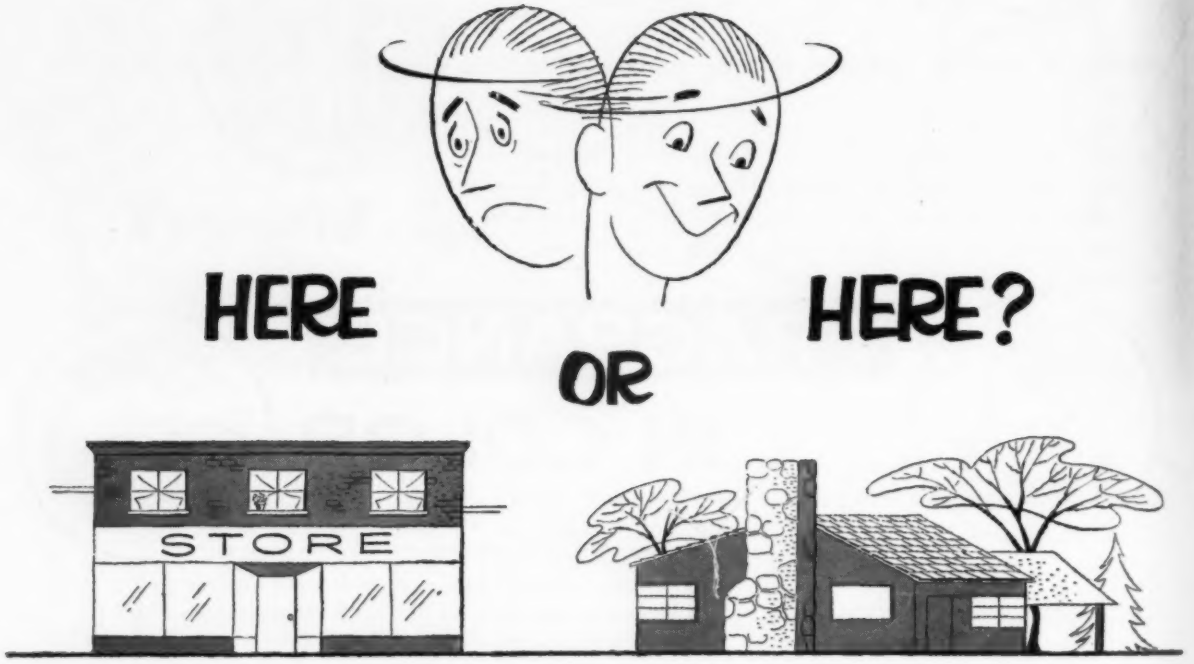

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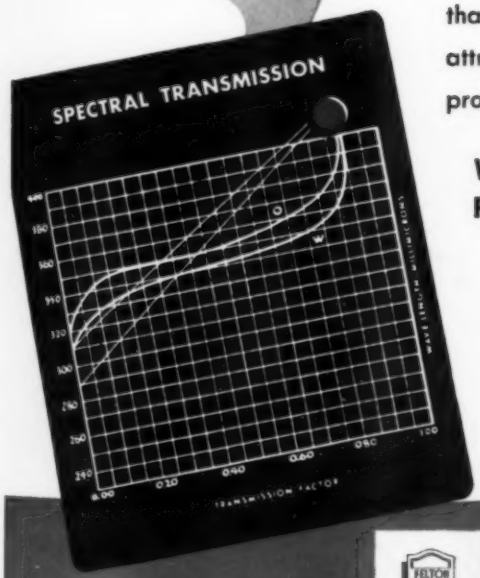

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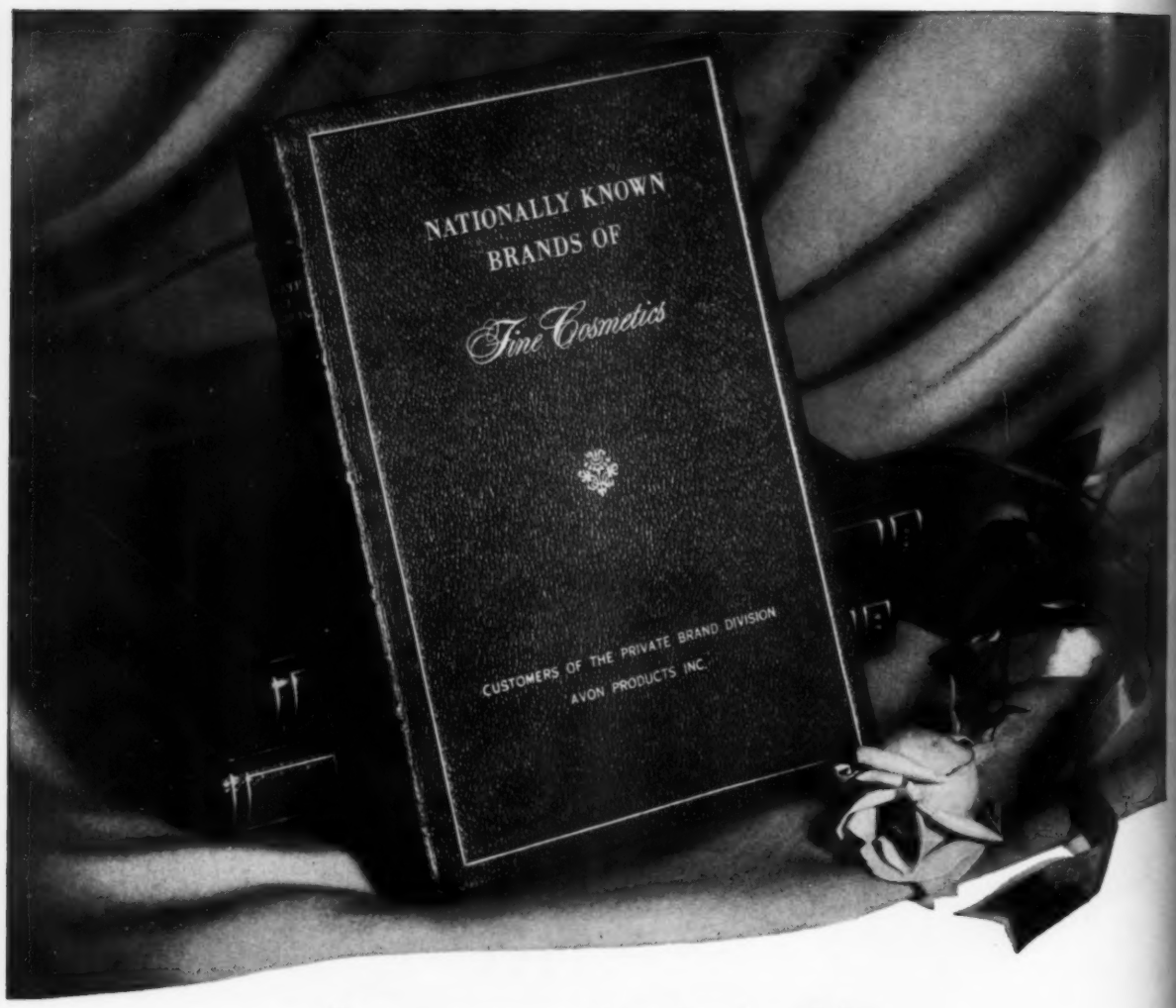

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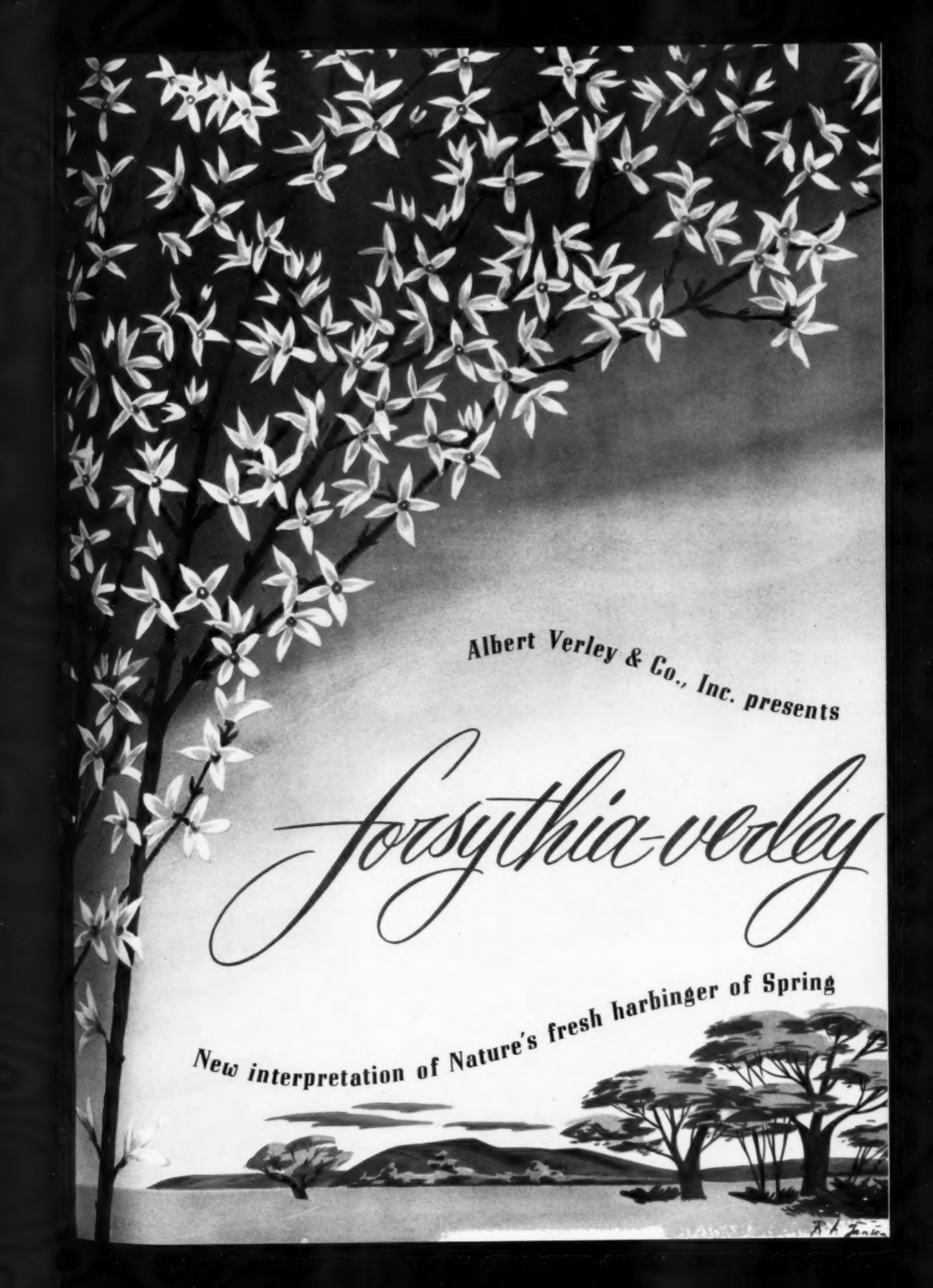
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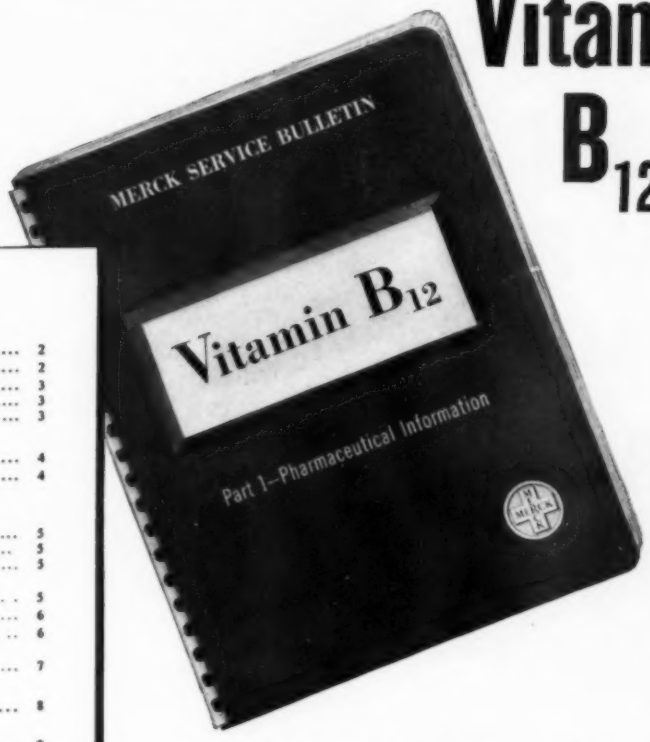

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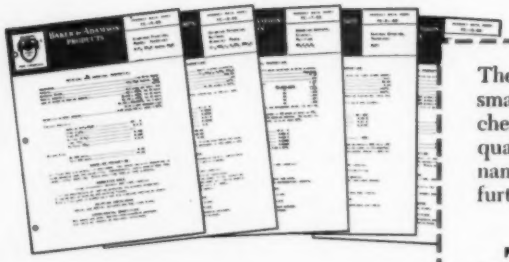

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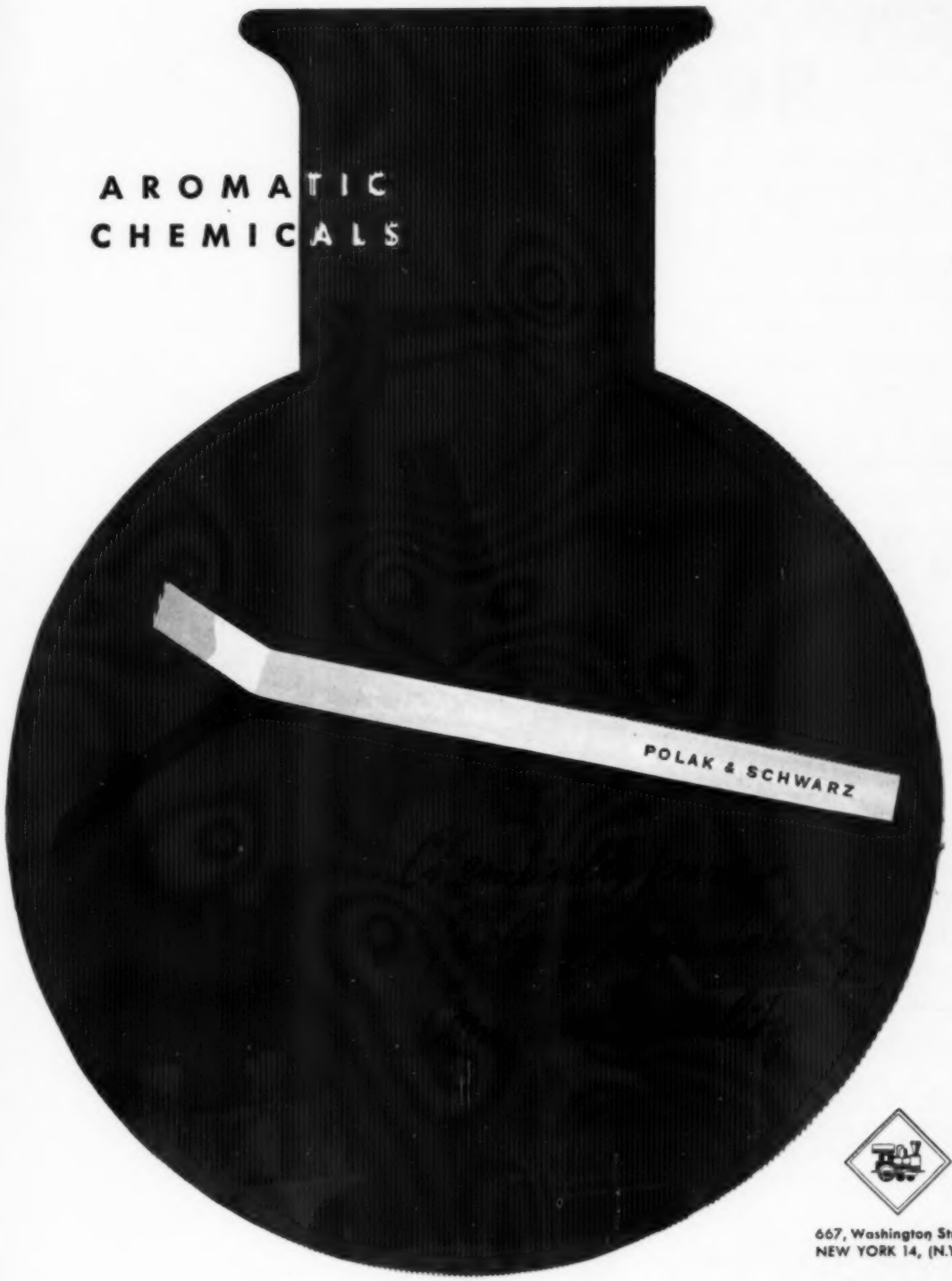

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U.S.I. CHEMICAL NEWS

February ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1954

Pests Do Not Develop High Resistance To Pyrethrins, Allethrin

A recent report noted that the high resistance pests develop to some insecticides disappears when the insecticide is no longer used. However, about 12 generations of non-exposure to the insecticide must pass for pests to lose their resistance. Even then, it was indicated, the number of generations of effectiveness is likely to be less than before.

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New Electronic Camera Takes High-Speed Pictures

A new camera reportedly can take a picture in only one tenth of one millionth of one second. Its speed is said to be so great that it can photographically chop a beam of light into separate segments. The shutter is described as a Kerr cell consisting of two screens of polarized material separated by a solution of nitrobenzene. An electronic device applies a high electrical potential across the cell. The shutter holds out light until the electrical charge realigns the molecules of nitrobenzene, thus permitting light to pass through the cell onto the film.

According to the manufacturer there are no moving parts and the electrical power needed to take the picture is no greater than that required to light a Christmas tree bulb. The new camera promises to have a number of uses in the study of industrial processes, such as the observation of jet engine combustion.

Continuous Separation In New-Type Dry Classifier

A new type of dry classifier which continuously separates coarse and fine air-borne particles has been announced. According to the manufacturer it can be used in a closed circuit with a pulverizing mill, or as a self-contained sizing unit for any moving stream of air-solids mixture.

The classifier is described as basically an inverted, truncated-cone shell with a motor-driven, bladed rotor revolving on a vertical center axis inside the outer shell. The raw mixture of coarse and fine air-borne material is fed in from the bottom of the cone, passes upward in the annular space occupied by the whirling blades, describes a circular motion above the rotor, and discharges through a central opening in the top. Oversize particles are removed by the impact of the blades or drop out in the eddy-current above the rotor.

Cotton Growers Cut Cost Of Weeding as Much as 50% With CIPC Formulations

Show Excellent Promise for Soybeans, Legumes, Vegetables and Other Crops

Striking accounts of the savings in labor costs through the use of CIPC herbicides have been published recently. For example, one cotton grower's hoeing costs were reduced from approximately $12.00 to $0.50 an acre in an area treated with 3 pounds of CIPC per acre. Chemical weed control costs under these conditions are reasonably constant at $5.00 to $6.00 an acre, indicating a saving of about $6.00 an acre.

Hoeing costs to control weeds are about $12.00 an acre in cotton fields like this.

According to the National Cotton Council, a substantial part of the cost of producing cotton is that of weed control—which previously has been done largely by hand hoeing. Today, however, the average cotton grower is faced with a steadily shrinking labor force and the necessity of paying higher wages. His labor costs are unpredictable, and any means of reducing them and saving money is an economic necessity. If for no other reason than this, more and more cotton growers are using CIPC weed control formulations.

CIPC formulations have been reported equal or superior to the best known commercial herbicides for cotton weed control. Two things assure their increasing use in this field: the fact that CIPC gives highly satisfactory weed control, and repeated demonstrations showing that it is the safest compound available.

Many Promising Uses

CIPC formulations are usually applied to the soil after planting but before the emergence of the crop plant. Although CIPC first

MORE

Leading Ag Colleges Find Riboflavin Levels Too Low

Reports from leading agricultural colleges indicate that previously recommended riboflavin levels in animal feeds are too low for optimum growth and feed efficiency. Many experiment station authorities are increasing their recommendations for riboflavin additions to several times more than those of the National Research Council. Levels of supplemental riboflavin as high as 6 to 9 grams per ton of finished feed are often recommended.

U.S.I. offers a wide choice of riboflavin products derived from natural fermentation sources to meet the needs of the feed industry.

Antifoam Spray Is Aerosol-Packaged

Designed for foam control in the laboratory, pilot plant or other small scale processing, a new antifoam spray is said to combine rapid speed with maximum effectiveness. The spray is an aerosol-packaged dispersion of silicone compound in freon. It blankets foam with a cloud of finely divided particles of silicone. In most cases, the manufacturer states, no trace of silicone can be detected in the finished batch after defoaming. Effective concentrations of silicone are reported usually to range from 0.01 to 1.0 part per million, which is less than the 10 p.p.m. the Food and Drug Administration allows. The freon propellent vaporizes upon discharge.

Masking Tape Withstands Temperatures up to 375° F.

Masking tape designed for use in oven temperatures up to 325°F. is now available in ¼ to 36-inch widths, according to a recent report. Laboratory and field tests indicate that the tape can be used in temperatures as high as 375°F. The new tape is said to remove cleanly from treated metal surfaces, leaving no adhesive deposit and to be capable of withstanding much longer bake cycles.

It is thought that aircraft assembly, engine and parts manufacturers will be able to use the new tape for high-heat masking on treated metals such as anodized aluminum, pickeled steel and dichromated magnesium. Electronics manufacturers, among others in the metal finishing trade, should have need for the pressure-sensitive masking tape.

CONTINUED

CIPC Cuts Weeding Costs

gained recognition for the control of weeds in cotton growing, it has excellent potentialities for the control of weeds in soybeans, sugar beets, certain legumes, vegetable crops,

Weed control results after application of CIPC at the rate of two pounds per acre. No manual weeding has been required. Plants are, bottom to top, green beans, corn, peanuts, soybeans and cotton.

strawberries, ornamentals and nursery stock. CIPC also has been used to control weedy grasses in fence rows, along roadways, in fire lanes, in perennial grass seed crops and in other miscellaneous crops.

It is "extremely effective" in keeping stored potatoes from sprouting, and recently published results indicate CIPC shows unusual promise for fruit thinning of peaches. There is every indication that the already large number of uses for CIPC formulations will expand in the future.

U.S.I. produces CIPC as a 70 per cent solution concentrate in xylene, from which formulators usually prepare ready-to-use herbicides containing 4 pounds of CIPC per gallon by adding emulsifiers and additional solvent.

The amount of CIPC used per acre will vary from 1 to 8 pounds. This depends on the crop and type of weed involved and on the type of soil. In general, as the soil changes from a light sandy loam to a heavy loam the amount of CIPC required for weed control will increase. CIPC is used under a wide variety of climatic and agronomic conditions, and there are, of course, variations in performance. Therefore, local authorities should be consulted for recommendations on its use.

Technical data on CIPC and IPC, another U.S.I. weed controller, are available upon request. The latest CIPC bulletin lists more than 70 helpful references.

Ten to Twenty Year Life For New Storage Battery

A new type of storage battery with a life expectancy of ten to twenty years has been announced as available to manufacturers for testing and appraisal. It is claimed that while the initial cost of the battery is two to five times as much as the conventional type, it lasts so much longer that the actual cost is perhaps half as much.

The new battery uses nickel cadmium cells of a special sintered plate type in place of lead. Reported to be unaffected by shock and vibration, and to eliminate the worry of overcharging, reverse charging or short circuiting, it contains an alkaline solution instead of acid and will operate at temperatures as low as 65 degrees below zero or as high as 165 degrees Fahrenheit.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Stopcock grease for high vacuum use is available in three grades. The grease reportedly provides proper viscosity for temperatures from 60° to 110° F., shows very low hydrocarbon absorption, and permits pumpdown in vacuum systems. **(No. 1010)**

Fire-resistant translucent fiberglass panels designed for critical fire areas are claimed to offer adequate color stability. Uses include structural and decorative applications. **(No. 1011)**

A new flash-point tester is electrically-heated. A 150-watt heater and variable-power transformer with reproducible setting are reported to supply the close heat control needed by the ASTM D-56 test. **(No. 1012)**

A new paper making process uses 40% of cheap poplar wood, according to a recent report. Previously only 10 per cent of poplar has been successfully used, it was stated. In addition to special pulp grinding methods, a new chemical process was used. **(No. 1013)**

A new coal additive, described as simple to use, is said to reduce heating costs, do away with hard clinkers, eliminate odors and soot, and enable a banked fire to start up instantly. **(No. 1014)**

A copper plating process reportedly produces mirror brightness, avoids pitting of the cathode and holds brightener breakdown to a minimum. According to the developers of the process, it increases plating production up to 60%. **(No. 1015)**

For measuring fast pressure changes at temperatures as high as 5000° F., a new pressure pick-up is little larger than a cigarette. The instrument component is said to dispose of heat at a rate of 11 BTU's a second over each square inch of its surface. **(No. 1016)**

A new detergent for dry cleaning systems is said to increase the removal of water-soluble stains and to eliminate shrinkage, breaking and water stain. The detergent permits the use of larger amounts of moisture. **(No. 1017)**

Organosodium compounds and their derivatives can now be made economically, using finely dispersed sodium. A new booklet describes easy preparation methods using simple mixing procedures. Yields are said to be high, and reaction rates easy to control. **(No. 1018)**

A new microfilmer has been announced as offering five different reduction ratios and a choice of either 16 mm. or 35 mm. film. According to the manufacturer it provides a choice of three accepted methods of microfilming: standard, duo and duplex. **(No. 1019)**

PRODUCTS OF U.S.I.

ALCOHOLS
Amyl Alcohol (Isoamyl Alcohol)
Butanol (Normal-Butyl Alcohol)
Fusel Oil — Refined
Propanol (Normal-Propyl Alcohol)

Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof U.S.P., Absolute—200 Proof
Solox*—proprietary solvent—regular and anhydrous

ANTI-FREEZE
Super Pyro* Anti-Freeze
U.S.I. Permanent Anti-Freeze

ETHERS
Ethyl Ether, U.S.P.
Ethyl Ether, Absolute—A.C.S.

ACETONE—A.C.S.

ANSOLS
Ansol* M
Ansol* PR

ACETIC ESTERS
Amyl Acetate—Commercial and High Test
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate

OXALIC ESTERS
Dibutyl Oxalate
Diethyl Oxalate

PHTHALIC ESTERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate

OTHER ESTERS
Diatol*
Diethyl Carbonate
Ethyl Chloroformate

RESINS (Synthetic and Natural)
Arochem*—modified types
Arofene*—pure phenolics
Aroflat*—for special flat finishes
Aroflint*—room temperature curing phenolic
Araplaz*—alkyds and allied materials
Aropol*—copolymer modified alkyds
Ester Gums—all types
Natural Resins—all standard grades

INSECTICIDE MATERIALS
Allethrin
CPR Concentrates: Liquid & Dust
Piperonyl Butoxide
Piperonyl Cyclonene
Pyrenone* Concentrates: Liquid & Dust
Pyrethrum Products: Liquid and Dust
Rotenone Products: Liquid and Dust

INSECTIFUGE MATERIALS
Indalone*
Triple-Mix Repellents

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

FEED PRODUCTS
Calcium Pantothenate (Feed Grade)
Choline Chloride
Curbay B-G* 80
DL-Methionine (Feed Grade)
Niacin, U.S.P.
Riboflavin Concentrates
Special Liquid Curbay*
U.S.I. Vitamin B_{12} and Antibiotic Feed Supplements
Vacatone* 40

OTHER PRODUCTS
Acetaldehyde
Caustic Soda
Ethylene
IPC (Isopropyl-N-Phenyl Carbomate)
CIPC
Liquid Chlorine
Metallic Sodium
Methionine (Pharm.)
N-Acetyl DL-Methionine
Nitrocellulose Solns.
Propionaldehyde
Propionic Acid
Sulfuric Acid
Urethan, U.S.P.

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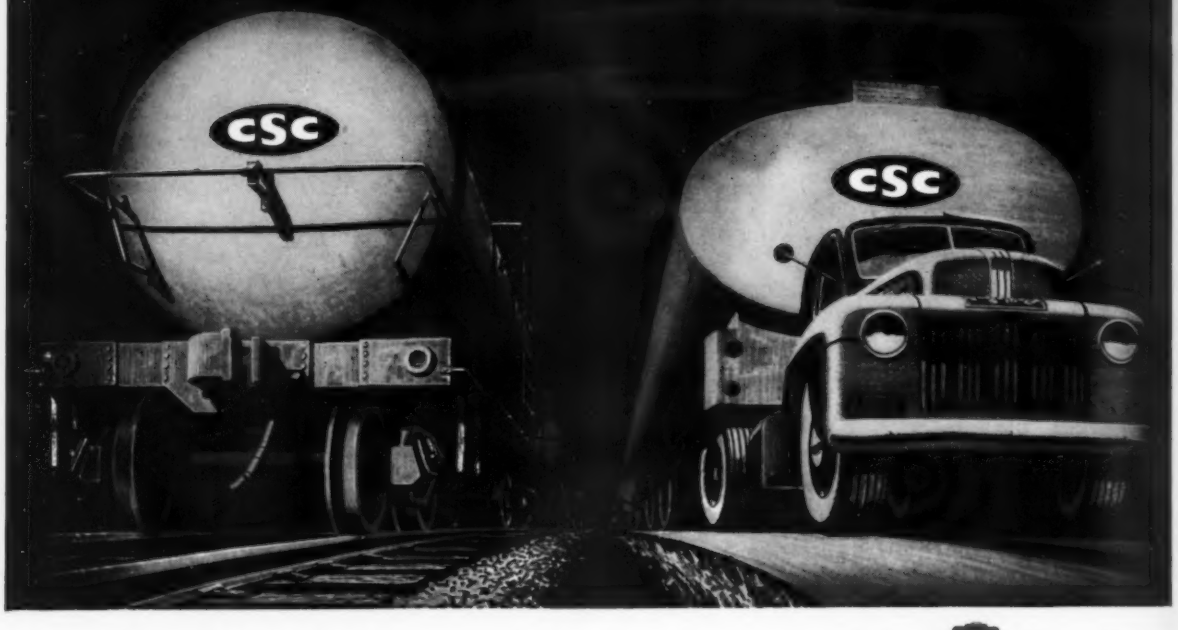

Usage for industrial alcohols has reached an unparalleled level during the past decade . . . creating a demand that Commercial Solvents Corporation, a pioneer in alcohol research and production, has answered by producing more ethyl alcohols and derivatives for the chemical industry.

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CSC ethyl alcohols are available in all formulas and grades to meet the most exacting requirements of the pharmaceutical and industrial trades.

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Rossville Algrain® Alcohol U.S.P.
Rossville Gold Shield® U.S.P.
Shellacol®
Quixol® Quakersol®

DERIVATIVES

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Butyl Lactate	Riboflavin Crystals
Butyl Acetate	Hydroxylammonium Salts
Butyl Stearate	Nitroparaffins
Dibutyl Phthalate	Formaldehyde N.F.
Tributyl Phosphate	Pentaerythritol
Methanol	Acetone
Ammonia	Methylamines

INDUSTRIAL CHEMICALS DIVISION

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- **RESEDALIA** . . . . . To make your Lily and Lilac scents come thrillingly alive . . . add ½ to ¾%.
- **CYCLAMAL** . . . . . Add up to 5% . . . for a cleaner, crisper impact.
- **CUMIN KETONE** . . See how only ¼ to ½% added to your present floral fragrance heightens and freshens the effect.

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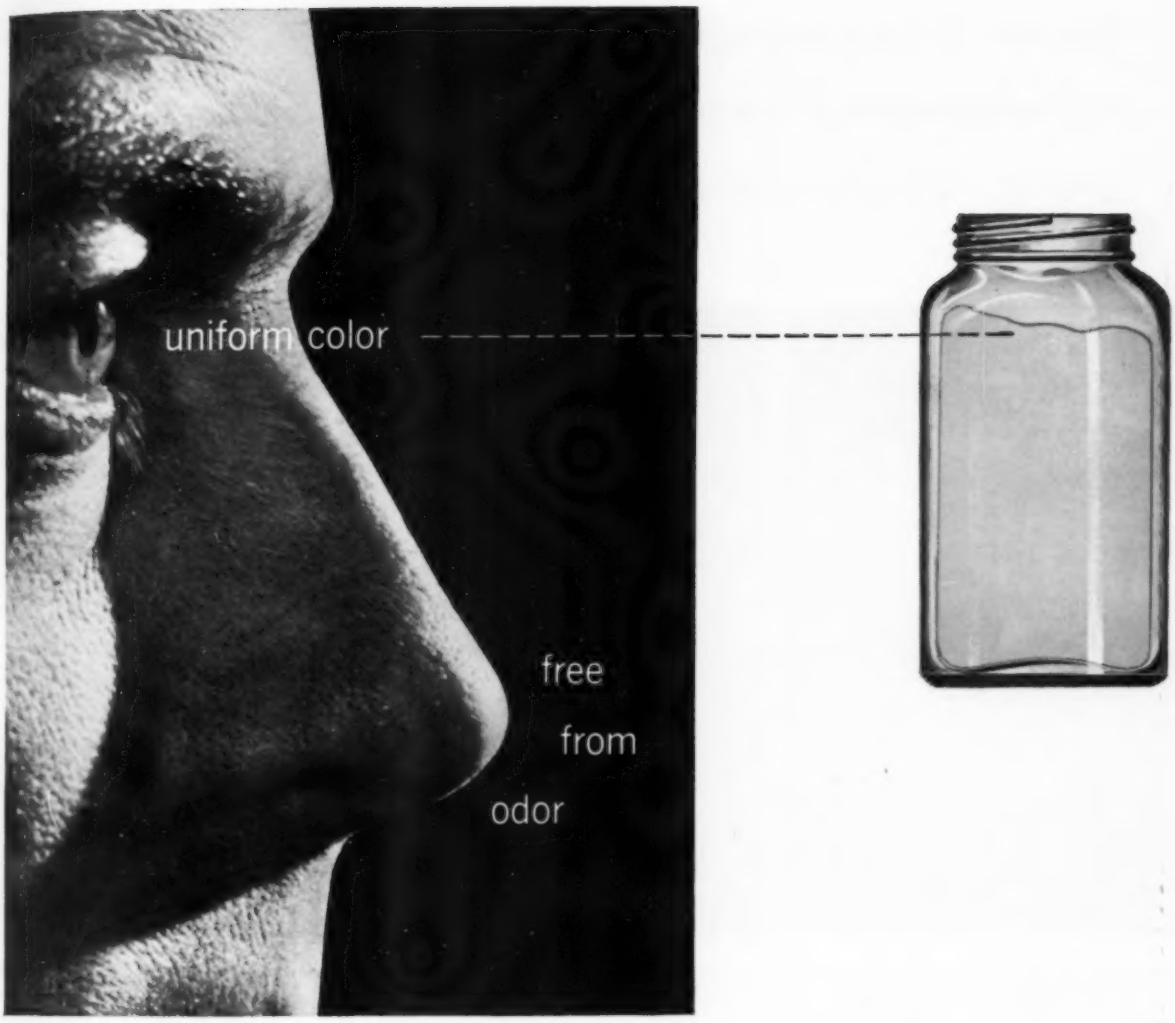

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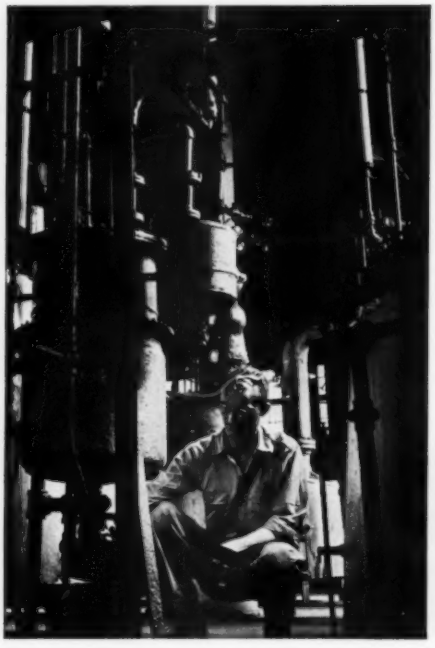
How Givaudan's continuing research helps solve your fragrance problems

A program of continuing research, integrated throughout all Givaudan laboratories, is constantly making available new and better materials to perfume, soap and cosmetic manufacturers.



The complete variety of aromatic chemicals manufactured by Givaudan represents long pioneering in the development of these "keystones of progress" in perfumery.

Many successful perfumes owe their outstanding originality and beauty to specialties developed through Givaudan's research and creative ability.

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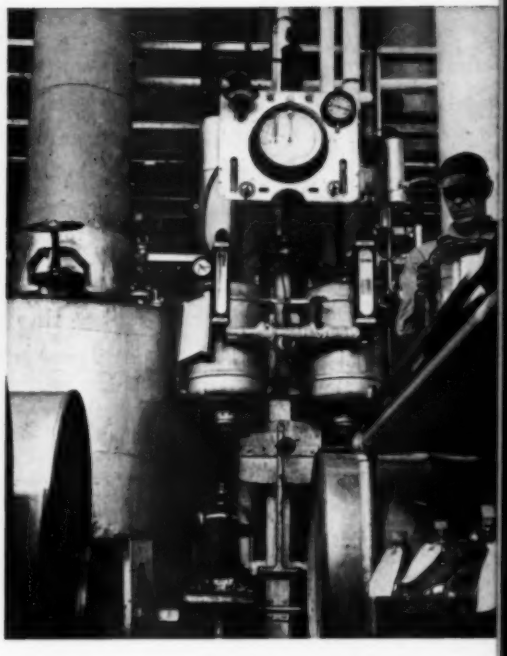
Givaudan's Aerosol Laboratory enables us to offer odors in pressure-propelled products which have been fully tested for compatibility, corrosion, solubility and fixation.

Shelf testing has long been an important part of Givaudan's service. Our staff will cooperate with you in paralleling our tests with yours, thus providing a double check.



As the largest manufacturer of aromatics, Givaudan can meet all needs, large or small, for quality and variety, and also give close attention to special problems.

Continuing research, together with modern production facilities, enables Givaudan to give its customers valuable cooperation in product development.

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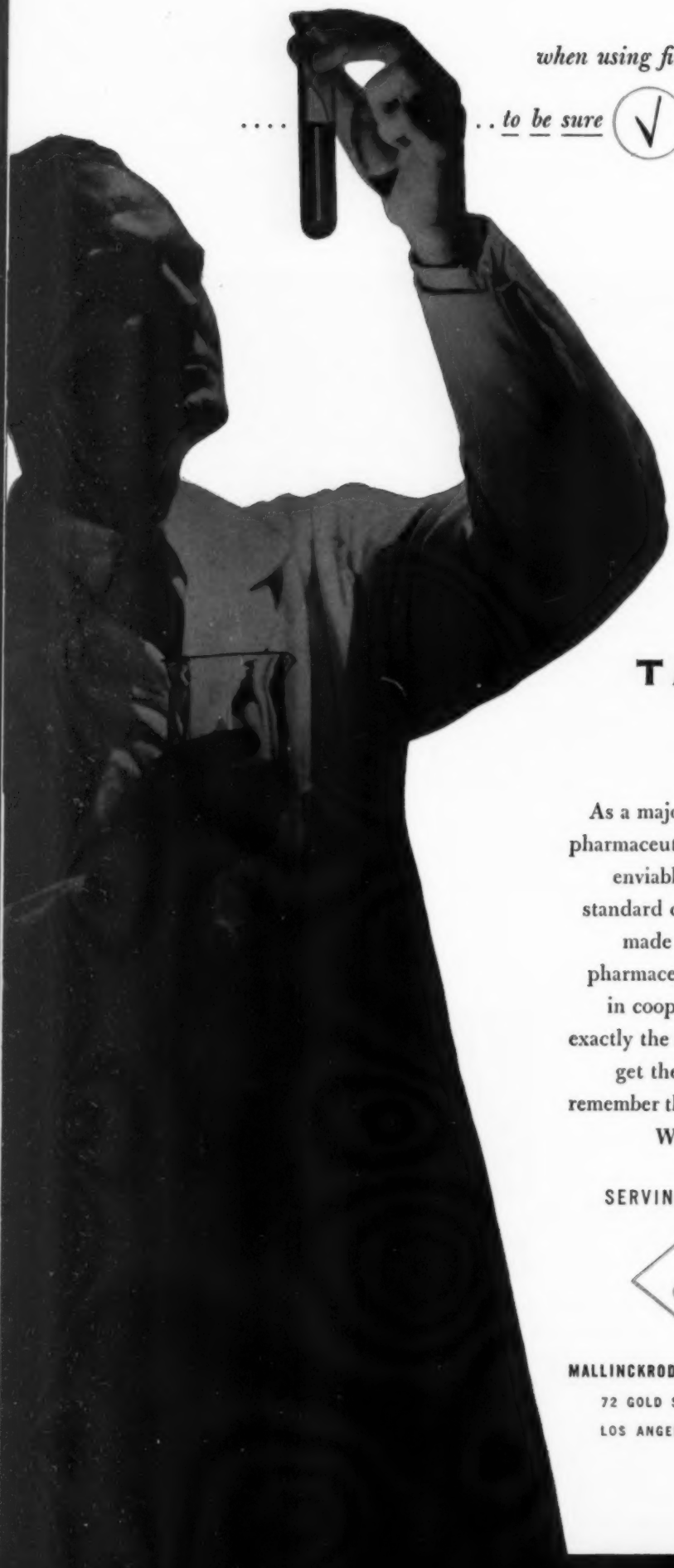

when using fine chemicals

.... ..*to be sure* (√) *check the source*

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CHEMICALS

As a major supplier of fine, dependable chemicals to the pharmaceutical manufacturer, Mallinckrodt has long had an enviable reputation. This was earned not only with standard chemicals, but with chemicals and intermediates made *to specification* for the greatest names in the pharmaceutical field. Mallinckrodt's chemists often work in cooperation with pharmaceutical houses to create exactly the right chemical, with the right properties—and to get the job done at the right time. This is good to remember the next time you set out to develop a new product. Write us if you have questions or a problem.

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Keeping Posted

F.D.A. Personnel Problems

Personnel of the Food & Drug Administration continues to be cut by reduced Congressional appropriations despite the steadily increasing work of enforcement facing the FDA, according to Food and Drugs Commissioner Charles W. Crawford. In Commissioner Crawford's paper read before the Food, Drug, and Cosmetic Law Section, New York State Bar Association by Charles A. Herrmann, Chief of the New York Station, FDA enforcement personnel, which reached a peak of 944 in 1951, dropped to 919 in 1952, then dropped further to 862 for 1953, and today stands at 797.

"Through these years," said Mr. Crawford, the workload was further increasing by the growth in population, by expanding technological processes of production, and by the continuing increase in the proportion of the total production of these commodities introduced into interstate commerce.

"Consumers spend about one-fourth of their total income for foods, drugs, cosmetics, and therapeutic devices. The retail value of these commodities which move annually in interstate commerce is about $50 billion, an average of nearly a quarter of a billion dollars for each of the 207 field inspectors and 15 import examiners now on our rolls.

"About 96,000 manufacturing, processing, and warehousing establishments do a substantial interstate business. At our current rate of operations each of these can be inspected once in about twelve years. The amount of these commodities to which attention can be given annually through inspection of factories and warehouses and by examination of representative official samples from interstate shipments is less than 1/10 of one per cent of the total interstate traffic.

"Official samples are collected only when information, usually obtained by inspection, indicates possible violations. Over the past several years an average of about 20 per cent of the official samples have been found so seriously in violation as to warrant court action. Unquestionably the work could be multiplied several-fold without approaching the point of diminishing returns."

As to the areas of enforcement which are being followed by this restricted personnel, Commissioner Crawford said:

"To meet this situation with the least possible risk to consumer welfare, we cannot slacken our activities in protection of health. This precludes any significant cutback on our drug work, even in misbranding cases, for drugs misrepresented for serious disease conditions can cause serious harm. Our cosmetic work has been mainly confined to potentially injurious items. This leaves a reduction in work on foods as our only alternative.

"In the food field, we can make no cutback on products contaminated with poisonous substances."

"So little work on economic violations was done in fiscal 1953 that even drastic curtailment will not meet the deficit. The whole food standards program will lose ground, both in the formulation of new standards, which requires a substantial amount of field study, and in the enforcement of standards already on the books. Sufficient savings to cover the deficit can be made only by reducing work on sanitation and on filthy and decomposed foods."

As a result of these statements in Commissioner Crawford's paper, the Section adopted a resolution urging Congress "in effecting budget economies to avoid impairment of the Federal Food & Drug Administration's food standards program or any relaxation of law enforcement for the protection of consumers."

Excellently Managed Companies

Eighteen companies in this industry have been certified as "excellently managed" by the American Institute of Management, New York. Eleven of them received the award for the fourth consecutive year: Abbott Laboratories, Bristol-Myers Company, Cheesebrough Manufacturing Company, Interchemical Corporation, Johnson & Johnson, Mathieson Chemical Corporation, Merck & Co., National Distillers Products Corporation, Parke, Davis & Co., Smith, Kline & French Laboratories, and Sterling Drug, Inc.

Three firms received the award for three consecutive years: International Cellucotton Products Co., Victor

Chemical Works, and Walgreen Co. Chas. Pfizer & Co. received the designation for the second year. Colgate-Palmolive Company, Gillette Company, and Procter & Gamble Company also were certified.

A.D.A. Knocks Anti-Enzymes

The American Dental Association reported last month that new evidence on the anti-enzyme tooth pastes does not support original claims made for their effectiveness in preventing tooth decay. The Association's Council on Dental Therapeutics said that the new research serves only to emphasize the Association's skepticism concerning the entire anti-enzyme field of dentifrices. In a resolution approved unanimously by the Council on January 23, this group said that it had reviewed the evidence on anti-enzyme dentifrices and had "found no satisfactory evidence of their effectiveness against tooth decay." The resolution also said that on the basis of the new evidence, there is doubt that one of the anti-enzyme tooth pastes now on the market would have the "superiorability" it claims to prevent decay-producing acid formation.

The resolution reads:

Whereas, the Council on Dental Therapeutics has reviewed the evidence concerning "anti-enzyme" dentifrices and has found no satisfactory clinical evidence of their effectiveness against tooth decay, and

Whereas, certain new evidence conflicts with the original claims as regards a superior ability of one of these dentifrices (containing sodium N-lauroyl sarcosinate) to prevent the occurrence of a dangerous acidity in the dental plaque, therefore be it

Resolved, that the Council on Dental Therapeutics emphasizes that

(1) there is doubt that a dentifrice containing sodium N-lauroyl sarcosinate will prevent the occurrence of a significantly low pH level on the tooth surface, and

(2) claims for the effectiveness of any anti-enzyme dentifrices are not yet substantiated.

New Hydrocortisone Synthesis

Scientists of the natural products research department of the Schering Corporation announced late last month a new synthesis of hydrocortisone or compound F which "affords a potentially cheap and plentiful supply" of this important drug. The report, given at the Sixth Annual Scientific Conference of the American Chemical Society's North Jersey Section by Dr. Eugene P. Oliveto, Miss Corrine Gerold, and Dr. E. B. Hershberg, describes a unique method in the transformation of ox bile into hydrocortisone.

Formic Acid is used to yield a formate of the delicate steroid compound obtained from ox bile or from fermentation processes. This formate goes through the later steps in the synthesis without destruction of the complicated molecular structure which makes the compound active against disease. A result of two years of research, the formate step was described as a "protective device for the sensitive hydroxyl group at position 11" in the molecular configuration. The advantage is that the protective formate can be removed by a chemical reaction which releases the hydrocortisone.

Mallinckrodt Uranium Work

More than twelve years after receiving the secret assignment to produce pure uranium oxide for the atomic energy program, Mallinckrodt Chemical Works and three other companies participating in Mallinckrodt Project 42-17 have received permission from the A.E.C. to tell their story for the first time in a joint advertising program which started in the January issue of Fortune. The other companies are Singmaster & Breyer, Blaw-Knox, and Wigton-Abbott Corporation.

Atoms to Art

Last month the Chemists' Club, New York, closed its Second Mid-Winter Exhibit of Arts and Crafts by members and employees. Occupying the entire right and left wings of the mezzanine in Rumford Hall the exhibit contained excellent examples of paintings by Dr. Lauren B. Hitchcock, Blyth Reynolds, Michael Lemmermeyer and Attico Vasquez. Interesting camera studies by Don Keyes were featured along with John Loughlin's amazing Brownie portraits of notables. An interesting collection of marine life specimens from Sanibel Island in the Gulf of Mexico by V. W. Zons, a mobile by Zola Deutsch and the art work for a modernistic Christmas Card by Haldane Gee completed a very successful showing.

An interesting feature of the exhibit was an oil painting of Fred Rauch, of S. B. Penick & Co., executed by Michael Lemmermeyer, of Aromatic Products.

Pfizer Markets Tetracycline

Chas. Pfizer & Co. has entered the market with tetracycline, but it is to be marketed through J. B. Roerig & Co., a division of Pfizer. Introduced under the trade name Tetracyn, the first dosage forms being made available are sugar-coated tablets and a preparation for intravenous administration. Other Pfizer antibiotics in finished form, including Terramycin, are marketed through the Pfizer Laboratories division of the company. Pfizer is the second company to announce tetracycline. The first was Lederle Laboratories.

Must Stop Hair Claims

The Hair & Scalp Clinic, Washington, D. C., has been ordered by an initial decision of a Federal Trade Commission hearing examiner to stop claiming that their preparations for the hair and scalp have any effect in preventing or overcoming baldness. The order also runs against claims that the products cause hair to take on new life; induce the growth of new hair or stunted hair; cause the permanent elimination of dandruff or itching, dryness, or oiliness of the scalp; or prevent or cure other scalp disorders.

Regarding use of the word, "clinic," in the corporate name, the examiner quoted Webster's New International Dictionary as defining clinic as "an institution ... in which concrete cases or problems of a special type are studied, and expert advice or treatment given." He also referred to "the rather common use of the word to refer to organizations and activities having no con-

nection with medical science." He therefore concluded that use of the word, "clinic", in the corporate name "is incapable of misleading any substantial portion of the public, and that this charge in the complaint has not been sustained."

Fair Trade Suit Seeks $25,000

Sterling Drug has filed a $25,000 fair trade damage suit in Newark, N. J., against Weissbard Brothers for "serious injury to its business, trade-marks and good will" sustained through fair trade price violations on Bayer Aspirin, Phillips' Milk of Magnesia and Double Danderine. In the complaint filed in Superior Court of New Jersey, Chancery Division, Essex County, Sterling is seeking under the New Jersey Fair Trade Act, temporary and permanent injunctions to restrain Weissbard from continuing "their unfair competition and interference" with Sterling's lawful fair trade contracts. The drug manufacturer has fair trade contracts "now in full force and effect" with retailers in New Jersey and in the city of Newark, the complaint notes. Despite Sterling's repeated demands that the defendant "cease and desist from their unlawful price cutting and unfair competition," Weissbard has refused to do so, according to the complaint. Sterling's "system of distribution within the State of New Jersey has been and will be demoralized and disrupted" and the company "has been and will be deprived of the benefit" of its contracts and the New Jersey Fair Trade Act, the complaint continues, unless the violations are enjoined.

Weissbard's violations of the minimum fair trade prices on Bayer, Phillips' and Danderine have not been "for the benefit of their customers or of the public generally," the complaint charges. The defendant is "using such products as loss leaders to attract customers into their places of business to sell other articles having higher markups and a greater margin of profit," according to the complaint.

Fair Trade Damage Suits

Damage suits "totaling more than one million dollars have been started during the past month by manufacturers against discount houses and other violators of minimum fair trade prices, and more actions of this type are on the way," Maurice Mermey said late last month. According to Mr. Mermey, "the growing drive to counteract 'bootleg' selling in the marketplace indicates a trend to curb violators by seeking stiff damages for past injuries as well as getting injunctions to prevent future injuries to manufacturers' trade-marks and distribution systems."

Manufacturers are also beginning to move in on mail order operators located in non-fair-trade areas who are openly defying the fair trade laws of adjacent states by violating fair trade prices in selling across state lines, said Mr. Mermey.

Fair trade actions seeking heavy damages listed by Mr. Mermey include: a $250,000 action against E. J. Korvette Co., New York discount house, brought by Helena Rubinstein, and a $25,000 suit against Korvette by Johnson & Johnson; a $200,000 suit against Charles Hawkins in California, entered by Westinghouse Corporation; three $50,000 damage suits against Hall of Distributors brought respectively by Benrus Watch Co., Bulova Watch Co. and Speidel Corp.; two have been brought by Sunbeam Corp. against 20th Century Co. and International Solgo, Inc.; Sterling Drug has filed a $25,000 suit against Weissbard Brothers, Newark, N. J.

The Drug Business Today

Sales of pharmaceuticals have increased from $265 to $860 million at manufacturers' prices in ten short years from 1942 to 1952, according to Dr. Theodore G. Klumpp, president of Winthrop-Stearns. Druggists have shown a similar increase from $292,460,000 to $1,072,700,000 in the same period.

Per capita expenditures for drugs and sundries in 1952 was $10, according to Dr. Klumpp. Comparisons show that per capita expenditure for alcoholic beverages was $55; for tobacco products $32; for interest on personal debt $12.50; for auto repair, greasing, washing, parking, storage and rental $11; for admissions to specified spectator amusements $10.

Compared with $1,623,000,000 expended in 1952 for drug preparations and sundries, Dr. Klumpp finds that in that same year expenses for funeral and burial service, cemeteries and crematories, monuments and tombstones totaled $1,218,000,000.

Stating that "today a few pills costing perhaps several dollars are often the equivalent of what used to be a perilous illness with long disability, loss of earning, hospital and nursing expense and a convalescence that sometimes lasted a month," Dr. Klumpp continued:

"For instance, Dr. Ivor Griffith made a study of the cost of a case of pneumonia in a Philadelphia hospital in 1927. He found that the average hospital, doctor and nurse bills amounted to $358.00 and the duration of hospitalization averaged five weeks. During this time and a subsequent convalescent period, the loss of earnings brought the total cost of the illness up to approximately $1,000 and that was when a thousand dollars really was a thousand dollars. I can add that in 1953 the average duration of lobar pneumonia was less than two weeks with no period of convalescence required. Most cases were treated at home with antibiotics costing the patient approximately $15.12 if penicillin was used and $29.68 if one of the broad spectrum antibiotics was employed. We have no comparable figures for loss of earnings but it is nevertheless evident that our industry has brought about a great economic saving in the total cost of this and many other illnesses. How great these savings actually are in dollars and cents a good accountant such as Jim Hill can perhaps calculate. He would have to take into consideration the fact that many potential cases never get to be full blown pneumonia because of the prompt use of antibiotics. He would also have to remember that the undertaker used to get one good funeral out of every five cases of lobar pneumonia whereas today our industry has deprived him of almost all of this business.

"The trouble with the pharmaceutical business in the first place is that the purchaser can't tell the value and professional content of a pill by looking at it. In the second place the customer doesn't want it and doesn't get any pleasure from it. And, finally, it just isn't

human nature to feel deeply grateful for having been spared a perilous illness that he knew wasn't going to happen. In the old days when patients were snatched from death's door after a period of mortal peril and suffering, there was less complaint about the cost of medical care. Let's not forget that the drug treatment of an illness seems cheapest when there are no drugs known to treat it.

"All this points up the crying need for the industry to tell its story—which has never been adequately told, and to show the public that the cost of medication is not high. Our medical profession has a similar problem."

Klumpp on Substitution

Addressing the Drug, Chemical and Allied Trades Section of the New York Board of Trade, Dr. Theodore G. Klumpp, president of Winthrop-Stearns, Inc., and president of the recently organized National Pharmaceutical Council said that the Council aims to tackle the two internal problems facing the drug industry, namely substitution and duplication.

"There are basically two motives for substitution," said Dr. Klumpp. "The first is the plausible desire to avoid carrying a burdensome inventory of pharmaceuticals. To meet this problem our manufacturers have undertaken what no other industry known to me has done, namely to guarantee the sales of our products by taking back for full credit any unsold items. Some of us have even gone further than that to ease the retailers' inventory burden. In addition we have undertaken the major effort and expense of moving our brands through our detailing, advertising, sampling, direct mail and exhibits. If there is any more we can reasonably do, I'm sure we would like to know what it is.

The second motive is to get an article a little cheaper than the price asked by the brand manufacturer. How shortsighted this is should be self evident. The cheap substitutor or imitator cuts costs because he has spent nothing for research nor one red cent to create business for the retailer. With no reputation to sustain he is tempted to compromise on quality and control and thus offer a product of less reliability. He is the bootlegger of the drug industry. Of course he can offer his shoddy merchandise at a cheaper price but at the same time the retailers who deal with him are undermining the very foundations of their future business. . . .

"The economic effect of substitution, so far as the manufacturer is concerned, is severe. It is depriving us of 10, 20 and even as much as 40 per cent of the sales of certain of our products.

"The effect on competitors is likewise drastic. The retail druggists of America have properly cried out against chiselers in the marketplace who would assassinate their reputation for fair dealing. Yet he who substitutes is himself a chiseler. His first victim is the doctor's patient who, at best, got a product of uncertain quality. His other victims are the reputable retail pharmacists in the community who may be accused by the public of overcharging for prescriptions honestly compounded.

"Finally, continuation of such practices as substitution can result in weakening the structure of fair competition. You and I know that the laws of fair competition which the pharmaceutical industry prizes so highly are built around brand names. It is the brand name, for example, which gives fair trade its legal basis. To wipe out the brand name structure by substituting generic names is to wipe out the great protection against unfair competition which the retail druggists of America have worked so hard for so long to develop. I can think of no greater dis-service to the entire industry."

With regard to duplication by the manufacturers, Dr. Klumpp said:

"I pledge you my individual efforts to seek an equitable solution; and I am sure all of the reputable manufacturers will individually do their best, so far as they are able within the bounds of the anti-trust laws."

With regard to the National Pharmaceutical Council, Dr. Klumpp said:

"The National Pharmaceutical Council was organized to help solve some of the internal and perhaps some of the external problems of our industry. We are now in the process of organization and charting our course for the future. It is still too early for anyone to say exactly how we are going to proceed. However, there are certain basic ideas in the minds of its founders. The first is the firm conviction that an industry divided against itself cannot stand. We are not organized to drive a wedge between pharmacy and the manufacturers. On the contrary we believe that the interests of all of us will be best served by strengthening the bonds of common interest that hold us together. Our objective is a strong industry from one end to the other."

Medical Journal Advertising

The Association of Medical Advertising Agencies has issued a report on the first major attempt ever made jointly by agencies and publishers in this specialized field to improve the relationship and to evaluate the medium of periodical advertising.

At the first invitation luncheon seminar of the group, representatives of 35 publishers of 150 medical, drug, dental, nursing, and other professional journals met with representatives of medical and pharmaceutical agencies. The A.M.A.A. said its primary interest was to advance the role of periodical advertising. Seminar title was The Need for Factual Evidence on the Sales Producing Effectiveness of Publication Advertising. Two basic issues were crystallized during the three and a half hour discussion of mutual problems. They were: How could both parties cooperate to evaluate journal advertising as compared with other promotional media, such as direct mail, detailing, sampling; and how could they establish a set of criteria to measure that value and the preference features of individual books in the field.

Although no definite resolutions were passed in this first meeting, the publishers seemed inclined to leave the responsibility for draft of the criteria to the A.M.A.A. Many suggestions were made to use counsel and experience of such organizations as A.B.C., C.C.A., N.I.A.A. and the new Business Papers Association.

L. W. Frohlich, vice-president of A.M.A.A., asked the

publishers whether they would agree to provide agencies with uniform criteria for evaluation of the medium, or to help to develop the criteria. Mr. Frohlich listed twelve tangible criteria and three intangible criteria. Tangibles included cost per thousand, life of advertisement, selective coverage, new values in the publication, and presentation of the appearance and feature of the product. Intangibles included prestige building and friendliness.

William Douglas McAdams reported statistics showing the very small percentage of professional journals which belong to A.B.C. and C.C.A. Of 81 dental publications, for example, three were in C.C.A.

"The cost of professional publications is going up and the advertisers are taking a deeper look at the practices in the entire field," Mr. McAdams said. He suggested the A.M.A.A. form two committees, one on a functional level, the other on an ethical level.

Thomas Gardner of the American Medical Association reported that a new survey has substantiated the case for medical journal advertising. Depth interviews of 45 minutes and more were used with doctors to learn where they learned of a new product and why they prescribed it.

"More than $130,000,000 is spent by advertisers in all categories," Mr. Gardner said. Of this figure, $90,000,000 goes for detail men, $22,000,000 for direct mail, and less than $10,000,000 for medical journals. This survey shows that these specialty publications are not getting a share of the advertising dollar based on their relative effectiveness."

Court Changes F.D.C. Act Attitude

Illustrating with decisions by the U. S. Supreme Court that since its enactment in 1938 up to rather recently, the courts had interpreted the Food, Drug, and Cosmetic Act in a manner which went further than the actual wording of parts of the law itself in giving protection to the public, Vincent A. Kleinfeld cited recent court decisions which, he said indicated a "swing to the right."

Decisions cited as illustrations of the first phase were: Dotterweich case in which a corporate officer was held liable as well as the corporation. The Kordel case in which literature shipped apart from the product was ruled to be labeling. The Instanty Alberty case which covered the relationship between advertising and labeling with particular regard to "adequate directions for use." And finally Mr. Kleinfeld cited the Sullivan case in which sales of dangerous drugs at retail were brought under Federal jurisdiction.

The more recent decisions which Mr. Kleinfeld said indicated a "swing to the right," are the Bireley, Cream Wipt, Imitation Jam, and Cardiff cases which Mr. Kleinfeld said indicated "a reluctance on the part of the courts to supply what could readily have been inserted in the statute by Congress, as well as a hesitancy to expand the concept of economic adulteration."

"In the past," said Mr. Kleinfeld, "a potent argument advanced by the Government in many cases was the language of the Dotterweich case:

" 'The purposes of this legislation thus touch phases of the lives and health of people which, in the circumstances of modern industrialism are largely beyond self-protection. Regard for these purposes should infuse construction of the legislation if it is to be treated as a working instrument of government and not merely as a collection of English words.'

"This potent weapon handed to the Government by Mr. Justice Frankfurter was blunted by Mr. Justice Frankfurter in the Imitation Jam case, when he quoted from the language he had employed in the Dotterweich case and followed by saying:

" 'This is the attitude with which we should approach the problem of statutory construction now presented. But our problem is to construe what Congress has written. While we must be faithful to the purpose of the statute, we must remember that Congress expresses its purpose by words. It is for us to ascertain—neither to add nor to subtract, neither to delete nor distort.' "

Cold Wave Patent Invalid

The McDonough cold permanent hair wave patent which was pending for ten years in the patent office and was issued only after a court order, has been declared invalid in a Master's decision. The patent, which has been in litigation since it was issued in December, 1951, was before Federal District Judge Irving Kaufmann in New York. Judge Kaufmann referred the case to a Master who handed down a 130-page opinion in which infringement was found, but the patent was declared invalid. The subject is thoroughly covered by Thomas Cifelli, Jr., patent attorney, in Patent Thoughts and Trends on page 263 of this issue.

Cosmetic Colors

The Toilet Goods Association was represented at the hearing held last month by the Food and Drug Administration with reference to the deletion from the list of certified colors of certain colors which have been used since the 1938 Food, Drug, and Cosmetic Act was enacted. Evidence was presented by the FDA that these colors were harmful when taken in foods in the amounts in which they are normally used. However, under cross examination by counsel for the T.G.A., the FDA expert was unable to produce any evidence that the colors were harmful when applied to the skin. The T.G.A. representative therefore requested that these colors be kept on the list of certified colors for use in cosmetics even though they are discontinued as far as use in foods is concerned.

Hugo Mock, counsel for the Toilet Goods Association, spoke on this subject before the Food, Drug and Cosmetic Law Section of the New York State Bar Association. While he said that the cosmetic industry was very happy over being included in the Food, Drug, and Cosmetic Act and being regulated by the Food and Drug Administration, he believed that the law gave the authority for certification of colors which might be used only in cosmetics. Therefore, he saw no reason why colors which might prove harmful only when used in foods should be denied use in cosmetics in which they were harmless. He said he would let the drug manufacturers speak for themselves.

The Story Behind Coumarin

by Frank S. Child

Coumarin, for 75 years a flavor ingredient in numerous beverages and foods ranging from soft drinks and cocoa products to ice cream and baked goods, was dropped as a flavoring agent last year by virtually every U. S. food manufacturer; moreover, two states, Kansas and Wisconsin, recently amended their regulations and now forbid the manufacture or sale of foods containing this flavor. Although there has been much publicity on the suspected toxicity of coumarin, the Food and Drug Administration has not yet issued an official ruling concerning its use in foods.

It is not without just cause, therefore, that the flavoring industry questioned the wisdom of the four coumarin producers—Dow, du Pont, Monsanto and Trubek—when they declared in concert last May that they would not sell the chemical for food purposes, owing to the risk involved. Nor is it without good reason that the industry questioned the wisdom of the Food and Drug Administration's issuance in November, 1953, of a *proposed* ruling which suggested that coumarin be removed from the standards of cocoa products, thereby implying that it would be omitted from all other foods as well.

That coumarin has received so much publicity before a final F.D.A. ruling is regrettable, for much unnecessary damage has been done to the chemical's former prestige. Even more important, considerable harm has also been inflicted on the prestige of all chemicals in food.

Indeed, the coumarin incident, which appears to be the full story, is but a small part of the over-all subject—chemicals in food—which is now under intense examination. In order to understand those changes taking place in regard to chemical food additives, it is first necessary to review the underlying causes of the coumarin episode.

The first public mention of coumarin's alleged toxicity occurred on May 22, 1953, when the F.D.A. issued a press release which read, in part:

"The Food and Drug Administration of the Department of Health, Education and Welfare, announced today it has been informed by producers of coumarin that

they are voluntarily withdrawing this flavoring agent from sale for all uses in foods.

"Recent pharmacological research has raised a question of the safety of coumarin, particularly in view of the increasing use of this material."

This pharmacological research, it should be emphasized, had been undertaken and completed by private industry without the prior knowledge of the F.D.A. It all began when General Foods Corporation—whose policy, like that of food companies in general, is to test new foods in its own laboratories before releasing them to the public—made a test of a new flavor formulation and found the toxicity to be higher than desired. In evaluating each of the ingredients of this particular formulation, they discovered that coumarin was chiefly responsible. The company then requested Dr. Lloyd W. Hazleton, Pharmacologist, of Hazleton Laboratories, Falls Church, Va., to further evaluate the toxicity of each ingredient. As Dr. Hazleton later explained in a private communication, "The current studies, plus information in the literature, indicate that coumarin is relatively toxic to a wide variety of animal species. There is no reason to believe that the human species would be exempt from its toxic action. Since its most important deleterious action is an insidious damage to the liver, it is very difficult to determine whether humans have been injured by coumarin or not. When a deleterious action such as this is involved, and there is no really sensitive method of evaluating mild liver damage, it is almost impossible to determine whether it either has, or has not, injured human beings."

In the subsequent public hearing, before the Food and Drug Administration, on September 15, Dr. Hazleton presented all the data his laboratory had collected in experiments with dogs and rats and testified that coumarin is "poisonous and deleterious."

The F.D.A. after studying the information, published the following notice of a *proposed* rule making in the Federal register, November 3, 1953: "Recent investigations have shown that coumarin has toxic properties, should now be classed as a poisonous and deleterious substance, and is not suitable for use in foods, and so is not a suitable optional ingredient of the various chocolate products named in Finding 1."

"Finding 1" refers to the standards of identity for cacao products (including chocolate liquor, breakfast cocoa, sweet chocolate, milk chocolate and other cocoa products) which were set up as a result of a public hearing in 1940. In other words, from 1940 until 1953, the above standards of identity specifically stated that coumarin could be used as an optional ingredient in the flavoring of those cacao products. From this, manufacturers inferred that coumarin could also be used in any other food.

The F.D.A. went on to say that, in the interest of consumers, these definitions and standards of cacao products should be amended and that coumarin should be taken out. This was not an order. It was a *proposed* order.

Any one who wished to file exceptions to the findings of the hearing was allowed 30 days in which to do so—or until December 3, 1953. Presumably the next step will be taken by the F.D.A. when it issues a final ruling, stating either that coumarin may, or may not, be used in chocolate products. This will also mean that it may, or may not, be used in other foods, depending on the decision. It was still pondering the question by the time this magazine went to press early this month.

It is not surprising that the F.D.A. is taking such a long time in arriving at this decision, for the decree will establish an important precedent in food flavoring. The delay in announcing the final ruling, however, has caused much confusion. Because all manufacturers believe coumarin is now considered a risk by the F.D.A., they hesitate to use the chemical, and most of them have omitted it from hundreds of flavoring formulas. Some essential oil houses informed their customers many months ago they could still buy food flavors containing coumarin, if they wished. However, they were careful to point out that the F.D.A. had not issued a ruling at that time but might do so momentarily, and

(Continued on page 285)

Making Polio Vaccine

A scientist prepares safety tests on samples of each batch of vaccine at Parke, Davis & Company. Observations are made at the end of 3, 6, 10 and 14 days to be sure no live virus is present.

Five pharmaceutical manufacturers are engaged in producing vaccine for the National Foundation for Infantile Paralysis, which vaccine is to be used in the Foundation's nation-wide validity tests. This is an experimental vaccine which is to be tried in the mass immunization trials to be conducted by the Foundation.

The processing of this vaccine is being conducted on a non-profit basis. It represents the cooperation of these companies with the Foundation, and the distribution of the vaccine will be completely under the control of the Foundation.

The five companies producing the vaccine for the Foundation are: Cutter Laboratories, Eli Lilly and Company, Parke, Davis & Company, Pitman-Moore Co., and Wyeth Laboratories. All vaccine will bear the label of the Foundation.

The experimental product is the result of months of testing of a preparation developed by Dr. Jonas E. Salk, University of Pittsburgh scientist. The Salk method involves growing the polio virus on animal kidney tissue and then killing it by chemical means. Killed polio virus, when injected into the human body, touches off some of the Body's defense mechanisms against the disease. It is thought that this gives immunity, but additional proof will be sought in the mass clinical trials.

In the incubating room of the Lilly tissue-culture laboratory, roller drums containing hundreds of assay tubes revolve slowly. This gentle agitation of the fluid in the tubes assists the growth of the kidney tissues upon which the polio virus subsists.

Prior to the processing at Parke, Davis & Company, a virologist tests the raw fluid to make sure the concentration of polio virus is up to standard. If so, scientists then proceed with clarification, sterilization and other steps.

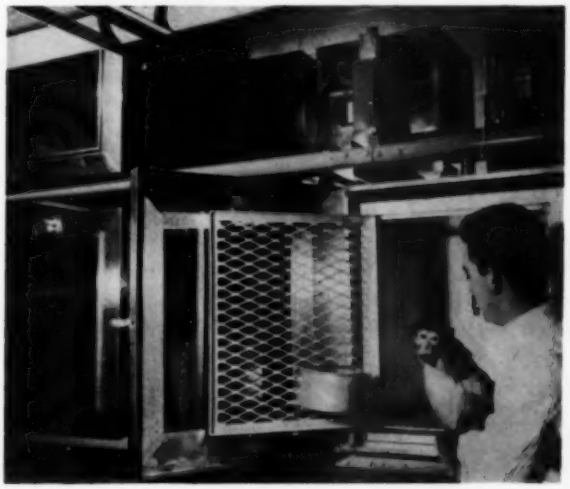
The live polio virus in the culture fluid is made harmless by the addition of formaldehyde at Parke, Davis & Company in Detroit. This is one of several steps designed to insure the safety of the final product.

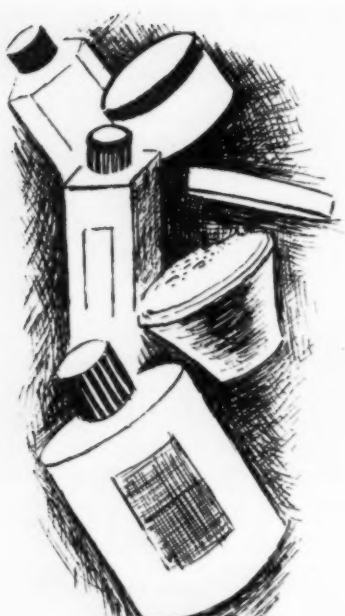
Raw tissue culture fluid containing a high concentration of polio virus is clarified through glass wool and purified in a filter press at Parke, Davis & Company.

Robert N. Hull, Ph.D., head of Eli Lilly & Company tissue-culture lab., examines animal kidney cells in an assay tube to determine amount of polio virus which has grown in sample taken from a virus production "pool."

Bacteriologist in Eli Lilly's biological development department "Pooling" polio virus from animal kidney tissue in 10-gallon bottle. Larger "pool" is put through process that inactivates, or kills, the virus.

Monkeys play an important role in the processing at Parke, Davis & Company. The final product is tested in live monkeys for 28 days before it's pronounced safe and effective.





Silicones in Cosmetics*

by E. G. Tajkowsky and T. H. Reilly

We should like to consider with you the properties and applications of silicones, especially where they may be of interest to the Toilet Goods Industry.

The silicones that are most likely to be useful are the fluids. They are essentially dimethylpolysiloxanes and are clear, colorless liquids which range from water-thin to ultra-high viscosity. These latter-gum substances are so thick they take a week to flow out of a test tube.

Silicone fluids are generally chemically inert, and highly water repellent; although they, themselves, cannot be wet by water, they will wet almost any other surface. Silicone fluids have extremely low surface tension and will therefore spread very readily. The surface tension value ranges between 20.5 dynes per cm. for the lower viscosities and 22 dynes for the higher viscosity fluids. This compares with 72 dynes for water and approximately 30-35 dynes per cm. for various oils.

Silicones exhibit a smaller change in viscosity with temperature than any other known fluid. Between 210° F and −10° F the viscosity increase of petroleum oil is more than 80 times greater than the viscosity increase of the silicones in the same temperature range.

In addition to the standard viscosities in which silicone fluids are available, any desired intermediate viscosity can be obtained by blending viscosities higher and lower than the desired one.

The change in specific gravity with temperature is essentially linear over the range of −58° F to 302° F.

Stabilized silicone fluids have excellent stability when exposed to air at high temperatures for long periods of time. For example, a silicone fluid of 500 centistoke viscosity showed an increase of only 2.4 per cent in viscosity when heated in air at 302° F for 1000 hours. They are relatively difficult to ignite, as indicated by flash points of the order of 600° F and autogenous ignition points of 800° F.

The silicone fluids have limited solubilities with most of the commonly used ingredients for cosmetic applications. However, products that are soluble in ethanol or isopropanol are available, and there are some interesting cosmetic uses under development, such as hand lotions.

Silicones are essentially transparent to visible light and ultra violet. Silicone fluids *per se* do not give protection against the burning rays of ultra violet but they do offer many advantages in suntan lotions when used in conjunction with sun screening additives.

Uses of Silicone Fluids

Let's consider how these fluids might be used in cosmetic and pharmaceutical products. Silicone fluids that have been thickened with inorganic materials such as silica aerogels will make unctuous greases that might be used as ointment bases.

They have been reported as being capable of use without dilution or thickeners, for certain special applica-

*Condensed from a paper presented before Scientific Section, Toilet Goods Association, Dec. 9, 1953.

tions such as medication carriers that release the dosages at slow, steady rates. This has been outlined in a U.S. patent for the efficient use of a keratin exfoliating agent.

The method of using silicone fluids that would probably be of most general use is in emulsified form. Considerable work on emulsification of silicone fluids has been done by our laboratories and by those of several manufacturers of emulsifying agents. In the past, our particular experience has been primarily with the emulsification of the silicone fluids themselves, or in conjunction with ingredients used in waxes and polishes.

In general, the emulsification procedures and equipment for silicones are the same as for the preparation of other emulsions. Depending upon emulsifiers used, these may range from open tanks with simple propeller or paddle agitators, to colloiding machinery that is widely used in many plants.

The emulsifiers used may be either anionic, cationic, or non-ionic, depending upon the particular type of product that you wish to make and the type of equipment available in your plant.

Our previous work is being extended in scope with emphasis on certain research aspects of cosmetic and pharmaceutical preparations. To this end, we have just concluded a study in conjunction with the Central Research Laboratories of Atlas Powder Company. This was on the use of silicone fluids in conjunction with materials used in a variety of cosmetics and pharmaceuticals. We would like to express our sincere thanks to Miss Phyllis Carter of Atlas Powder Co. for her assistance in preparing the formulations that are given below. These represent a wide cross-section of types of cosmetic products and illustrate a few of the possibilities for using silicone fluids.

The silicone fluids can be incorporated at one to 10 per cent concentration in most pharmaceutical and cosmetic formulas with no apparent difficulty. In most of the formulas which follow, General Electric silicone fluid, SF-96 (1000 centistokes) has been used, but fluids of different viscosities in the same series can undoubtedly be used in some of the formulas. The formulas include both soap-type and soap-free emulsions. They have all produced satisfactory preparations in the laboratory. However, results can be materially affected by differences in raw materials, rate of agitation, rate of cooling, and other conditions. Therefore, these formulas should be regarded as guides for further investigation by the formulator.

Formula No. 1, an O/W hand cream, is a typical vanishing cream containing a humectant at high concentration to contribute to its emollient effect. Ten per cent silicone fluid SF-96 (1000 centistokes) has been included to promote water repellency of the cream, making it a protective type cream for aqueous irritants. Formula No. 1 is a stable cream which develops pearl during storage.

Preparation: Heat (A) to 80° C. Heat (B) to 82° C. Add (B) to (A) slowly under continuous agitation. Continue agitation to 45°-50° C. Perfume and pack.

FORMULA No. 1
O/W Hand Cream

A	Hystrene T-70 ® fatty acid	15.0 per cent
	sopropyl palmitate	2.0 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	10.0 per cent
B	Potassium hydroxide	1.0 per cent
	Sorbo ®	18.3 per cent
	Water	53.7 per cent
	Preservative	q.s.
C	Perfume	q.s.

Formula No. 2, a stearic acid type cream, emulsified with non-ionic emulsifiers, provides a good ointment base in which silicones are incorporated. This formula produces a stable cream which has a matte surface. The silicone fluid promotes rapid disappearance of the ointment during application to the skin; in other words, it prevents "soaping up."

FORMULA No. 2
O/W Ointment Base

A	Hystrene ® T-70 fatty acid	12.5 per cent
	Span 60 ®	10.0 per cent
	Tween 60 ®	6.0 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	10.0 per cent
B	Water	61.5 per cent
	Preservative	q.s.

Preparation: Heat (A) to 80° C., (B) to 85° C. Add (B) to (A) with agitation. Agitate to 35° C. Pack.

A small percentage of silicone oil incorporated in brushless shaving cream improves its feel on application. Formula No. 3 contains one per cent SF-96 (1000) silicone fluid. This cream is a stable pearly product. The use of Tween 60, a hydrophilic non-ionic surfactant, aids in washing the cream from the face and razor.

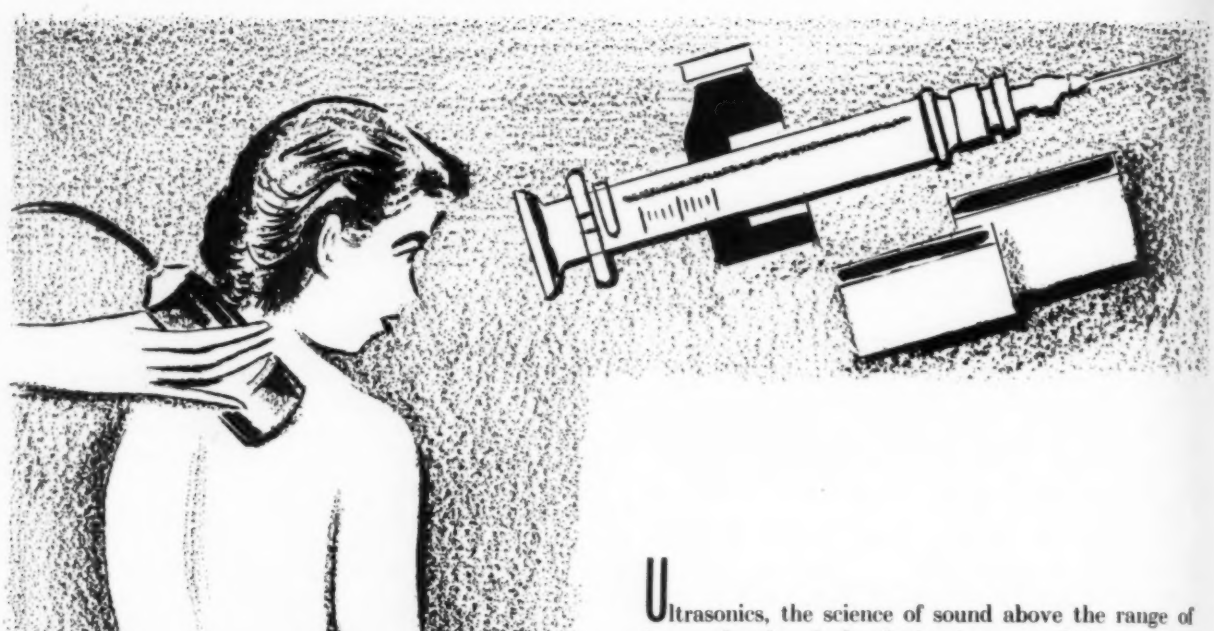
FORMULA No. 3
O/W Brushless Shaving Cream

A	Hystrene ® T-70 fatty acid	18.0 per cent
	Mineral oil	5.0 per cent
	Tween ® 60	5.0 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	1.0 per cent
B	Sorbo ®	5.0 per cent
	Borax	2.0 per cent
	Triethanolamine	1.0 per cent
	Water	63.0 per cent
	Preservative	q.s.
C	Perfume	q.s.

Preparation: Heat (A) to 90° C. Heat (B) to 95° C. Add (B) to (A) with stirring. After the cream reaches the set point, stop mechanical action and stir occasionally by hand until the preparation reaches room temperature.

Formula 4 is an example of the use of silicone fluid in a typical O/W cold cream emulsified by a combination of hydrophilic beeswax derivatives and soap.

(Continued on page 282)



Ultrasonics

by Milton A Lesser

Ultrasonics, the science of sound above the range of human hearing, is developing into one of the most interesting and valuable physical phenomena. Concentrated inaudible sound waves have already been called upon to accomplish difficult and seemingly impossible tasks. This effect has become an instrument of great promise in science, industry and medicine. The potentialities of this new tool are receiving considerable attention in the drug and cosmetic industries and in the field of therapeutics.

Ultrasonics is being studied from many angles. As remarked by Nelson and his colleagues,[1] interest in ultrasonic radiation has increased markedly during the last few years among physicists and chemists, who have studied and attempted to explain the propagation of ultrasonic waves and the phenomena involved; among acoustical engineers who claim the right of eminent domain on the subject; among aeronautical engineers, who, in the attainment of supersonic speeds with jet planes, have observed that ultrasonic vibrations are produced; among geologists, who use ultrasonics in detecting oil and mineral deposits and in the study of seismic effects; and among biologists and bacteriologists, who are interested in the effect of ultrasonics upon living organisms.

The efforts of these and other groups have resulted in the development of many laboratory and industrial applications of ultrasonic energy. Using ultrasonic vibrations, materials have been welded, new alloys created, whisky aging shortened, and disease germs disintegrated. In addition, ultrasonic waves have been used to drill holes, clear smog, speed plant growth, hasten the dyeing of fabrics and plastics, sterilize foods, and to penetrate hard or brittle substances like carbide, glass and ceramics.

These and other equally impressive results indicate that ultrasonics is about to come of age. As noted in one review[2] on this new technology, there are clear indications that valuable industrial applications of this

scientific tool will be forthcoming and that the medical and agricultural fields will also benefit greatly.

Although many ultrasonic applications are just emerging from the investigative stage, knowledge of this effect goes back to the last century. During the latter part of this period, a number of workers did basic research on ultrasonics. However, as remarked by Dickinson,[3] no noteworthy uses for this phenomenon are known to have been developed prior to World War I. At that time, Chilowsky and Langevin[4] tried to develop ultrasonic equipment for detecting submerged German U-boats. Actually, this idea did not obtain practical application until the development of Sonar (sound navigation and ranging) equipment during World War II.

It is interesting that the same principle is used by the bat. This animal guides itself during flight by emitting and receiving high frequency pulses, as high as 70,000 cycles per second, which are reflected by obstacles in its path.[5]

In the early 1920's relatively little work was done on ultrasonics. However, this picture changed in 1927 when Wood and Loomis[6] reported their studies on the physical, chemical and biological properties of ultrasonic waves. Working with sound at 200,000 to 500,000 vibrations per second, they demonstrated that ultrasonic energy could generate heat, produce emulsions, coagulate particles, form fogs, disrupt blood corpuscles and kill bacteria. Since then, great progress has been made and numerous reports have appeared on various aspects of ultrasonics.

It is commonly recognized that the human ear is capable of picking up sound waves of from 16 to about 20,000 cycles per second. As generally used the term "ultrasonics" refers to frequencies above 20,000 cycles per second and extending to millions of cycles per second. Since the rate of vibrations is in the range of thousands per second, the kilocycle is the unit of measurement. Thus, 800,000 vibrations per second is referred to as an 800 kilocycle frequency. According to Templeton,[7] the frequencies most frequently used in various biological, medical, commercial, and military applications have ranged from 100 to 1,500 kilocycles.

Ultrasonic radiations cannot pass through a vacuum as do electromagnetic vibrations but require a material medium for their propagation. Ultrasonic waves travel about four times as fast in liquids and up to 20 times as fast in solids as they do in air. They travel in a longitudinal rather than a horizontal plane. Because of this, the waves produces a push-pull effect upon objects in their path. Thus, a particle in an ultrasonic field may be forced to vibrate at a rate of 800,000 cycles per second. However, the particle will not be displaced from its position of rest by more than 1/100,000 of a centimeter.[7,8]

Intense ultrasonic waves are capable of producing unusual chemical, physical and biological phenomena. Although there is much to be learned, it is known that these vibrations of high frequency and short wave length produce their effects through several mechanisms. Some uses of ultrasonics, especially in the field of instrumentation, are based on such well-understood principles as echoing and resonance.[9]

However, many of the important applications of ultrasonics result from the effect known as "Cavitation." As defined by Weissler,[10] cavitation is the formation and violent collapse of small bubbles or cavities in a liquid as a result of pressure changes induced by ultrasonic vibrations. Thus, when liquids are irradiated with high-intensity ultrasonic waves they can be torn apart with the production of small voids containing gas or vapor at very low pressure. At the subsequent collapse of these voids, pressures of thousands of atmospheres occur locally.[11] The tremendous energy developed from the collapse of these cavities is responsible for many of the important effects of ultrasonic radiation.[1]

Cavitation is necessary in certain operations such as emulsification, ultrasonic cleaning, disruption of pathogenic bacteria, and sterilization. For certain other ultrasonic processes, like accelerating bacterial growth, internal heating, flocculation and precipitation, the cavitation effect is undesired.[12]

As explained by Williams,[11] there are several practical procedures for producing ultrasonic vibrations and the selection of the most suitable method is determined mainly by the type of material to be treated. Specially designed sirens and whistles are used for the production of intense waves in air. However, two other methods are commonly used commercially for the treatment of liquids and solids. One of these involves the use of magnetostrictive metals which change their length in a magnetic field. The other method employs piezoelectric crystals, such as quartz; the dimensions of the crystal changing when an electrical charge is applied to its faces. In a general way, notes Williams, it may be said that the two methods serve respectively for the generation of low frequency and of high frequency ultrasonics.

In citing the advantages of magnetostrictive generators or "transducers," he points out that it is possible to carry out many ultrasonic applications at lower frequencies than those supplied by a quartz crystal device. He feels that the employment of a magnetostrictive transducer provides greater robustness and reliability in the equipment.

However, as observed by Dickinson,[3] crystal-type generators have been most prominent in investigative work with ultrasonics. Such transducers are also the type commonly used in ultrasonic therapy. It has also been noted[9] that piezoelectric devices are almost unlimited in frequency range. Moreover, through the use of ceramic type piezoelectric materials, such as barium titanate which can be formed into a variety of shapes and sizes, it is possible to heighten the utility of ultrasonic generators.

Although much has been done in the way of providing suitable equipment, it has been stressed[9] that there is still a great need for a cheap, simple, high-power ultra-

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COURTESY TUSSY COSMETIQUES

Acid Creams

by Harry Hilfer

Emulsion technology has advanced at a somewhat rapid rate during the past ten years, because of the introduction to the market of a large number of synthetic chemicals with surface active properties. Prior to their introduction almost all emulsions were dependent on soaps as emulsifying agents and indeed soaps are still the primary emulsifiers used in the majority of cosmetic emulsions. New types of emulsions began to appear however, which were not dependent on soap emulsifiers. Among the first were the so-called absorption bases—derived from lanolin—and later sulfated alcohols. In conjunction with these substances, appeared non-ionic hydrophylic agencies such as glyceryl monosterate and cetyl alcohol. To these have since been added sorbitol esters and non-ionic emulsifiers where the relative size of the hydrophile and lipophile could be controlled by introductions of ethoxy groups. Most recently, quaternary ammonium compounds have also been added to a growing list of emulsifying agents.

It is possible to formulate creams with an acid pH from any of the emulsifiers referred to except soaps. In tracing the further development of the acid creams—that is creams with a pH less than the neutral range—

due credit should be given to the anti-perspirant creams, since these were the first examples of creams with low pH. With minor modifications they are still generally formulated in the same manner. They contain from ten to twenty per cent of glyceryl monostearate, usually, as the principal ingredient, in conjunction with fifteen to twenty per cent of aluminum salts in water. The glyceryl esters need an additional emulsifier to start the emulsification process but after the cream has "set" it is the glyceryl monostearate which keeps it stable. The added emulsifiers may be any one of a large number of available materials ranging from cationic substances to sulfated alcohols and including in some cases the alkyl aryl sulfonates. More recently there has been work done to indicate that non-ionic substitution for the ionic emulsifiers is possible, but the value of such a substitution is doubtful, unless it replaces an emulsifier which is hydrolyzed readily at the pH of the final preparation.

After the advent of the first of these anti-perspirant creams, interest in acid creams in general increased, since the pH of the skin mantle itself is in the range of 5.2-5.5 and it was thought that a cream with the same pH would be indicated. During the past five years preparations have appeared on the market, where the pH has been brought close to the pH of the skin. The value of the acid pH is still relatively controversial but there is a good deal of support given the theory that the acid pH renders otherwise pathogenic bacteria inactive and that the acid pH is a contributing factor to better skin respiration. These theories are difficult to prove. However, emulsions used as baby lotions should certainly be considered more efficient if they are capable of allaying to some extent the alkaline irritational effects of ammonia generated from the baby's urine and, by the same token, to neutralize the irritational effects of alkaline media to which housewives' hands are subjected. Creams with acid pH's should be better able to protect against such media than either neutral or alkaline creams. In my own opinion this seems to be a good enough argument for their existence.

In general, acid pH creams may be formulated in much the same manner as are the more conventional types which employ soap emulsifiers. The choice of the emulsifier however is somewhat more difficult because of the large number of different groups to choose from. Among the sulfated alcohols for example, there are the laryl and stearyl-cetyl mixture to choose from and in general the stearyl-cetyl alcohol sulfate behaves much as stearic acid soaps do. It seems to me that the line of demarcation seems to run along other than the size of the lipophilic radical. Formulation of the acid creams is more greatly eased by the addition of hydrophilic fatty acid esters than is the soap formulation. For example, the standardized vanishing cream consisting of a stearic acid soap in conjunction with a large excess of free stearic acid formed into a cream with water and glycerol is not as simply duplicated by a substitution of sodium stearyl or sodium cetyl sulfates for the soap. In most cases these emulsifiers must be used in conjunction with either hydrophilic esters or alcohols such as cetyl alcohol. The anti-perspirant creams already mentioned are good examples of that, and the same method of formulation applies even when there are no electrolytes used, though the concentration of the hydrophilic waxes could be lowered.

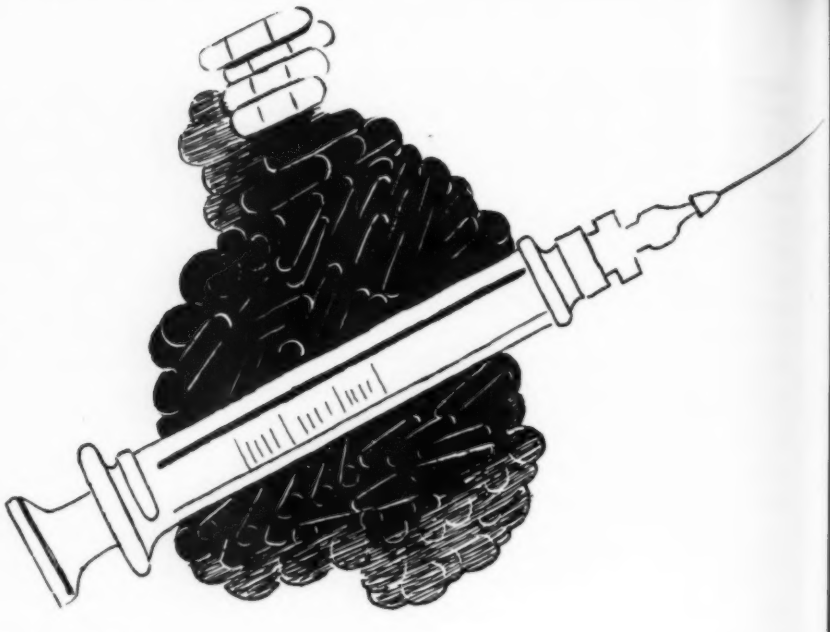
Desired effects are therefore more easily achieved by the nature and concentration of these hydrophylic waxes than by changes in the ionic emulsifiers. Large amounts of oils may be incorporated into such systems by changing these agencies rather than by altering the ionic emulsifier. Certainly, it would help if a change in the emulsifier were made to enhance the sought-after effect, but greater care in the changes in the waxes would yield even more gratifying results. In other words, I do not believe that there is any base formula which would be capable of withstanding additions or deletions of oils and still ensure the desired stability.

Alcohol sulfates have their drawbacks, though they are excellent emulsifiers. They are easily hydrolyzed by acids and of course the lower the pH, the more rapid is the hydrolysis. This may be retarded to a great extent by the introduction of buffers into the system and fixing the pH at a level where hydrolysis would proceed at a minimum rate. Actually the one foolproof method of prevention of hydrolysis is by the use of non-ionic emulsifiers which do not contain any hydrolysable groups. There are now available a large number of ethoxy esters of higher alcohols, which fit into this category and which are extremely stable against acid hydrolysis and which are also good emulsifiers. These are coming into greater use for this reason.

The cationic agencies in use consist of fatty acid ester amine hydrochlorides among others and also the quaternary ammonium compounds. These latter are being examined much more intensively at the present time and are being used in some cases because of the combination of effects they offer. The quaternary ammonium compounds are capable of being stable emulsifiers, imparting an acidic pH to their vehicles and at the same time being more highly substantive to the skin tissues. They are incompatible with soaps or other anionic substances and therefore provide a convenient means of precipitating them on contact. This, coupled with their high substantivity to the tissues, provides a better protective means than do the more conventional types of emulsions manufactured as hand creams or lotions.

Quaternary ammonium compounds are generally more irritating than are soaps or non-ionic emulsifiers, but if chosen properly and used in proper concentrations, they may be used without any undue irritational effects. When speaking of a large classification of compounds in broad general terms, it should be remembered in making comparisons as against other classifications that there is a good deal of overlapping. All quaternaries are not equally irritating any more than are all soaps, and it is certainly possible for the less irritating members of the group to be less harmful than the worst

(Continued on page 294)



Riboflavin Phosphate*

by Paul E. Sleezer, Michael S. Weiss and Gustav F. Siemers

HOFFMANN-LA ROCHE INC.,
NUTLEY, NEW JERSEY

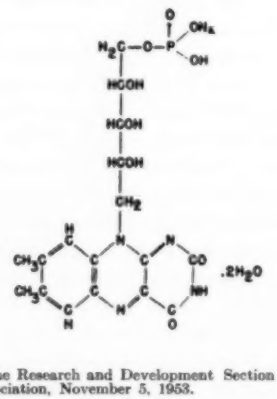
Kuhn and Karrer and their groups established the constitution of riboflavin by total synthesis in 1935. When commercial production soon followed, riboflavin became available in large quantities. From these early days on, pharmaceutical manufacturers have sought to increase the riboflavin content of liquid products. Many parenteral formulae contain at least several times as much thiamine as riboflavin. This is not rational in the light of Minimum Daily Requirements which are somewhat greater for vitamin B_2 than B_1. The limited solubility of riboflavin especially hampered the parenteral producer. Requirements for clarity, low viscosity and freedom from precipitate in a parenteral solution prevented resort to suspending agents or highly viscous products that sometimes made possible higher B_2 levels in oral solutions.

Substances with riboflavin solubilizing properties have been used extensively. Such substances have not been entirely satisfactory and have at best accomplished concentrations of only 2 to 3 mg. per cc. The inclusion of solubilizers has been considered objectionable for reasons beyond the limited (and sometimes temporary) B_2 concentrations that can be achieved. Large amounts of niacinamide, frequently as much as 50 mg. per cc., are used presumably to solubilize riboflavin. Such large doses of niacinamide do not have a biological basis. The answer to the problem appeared to lie in development of a more soluble form of riboflavin.

The large-scale synthesis of riboflavin-5′-phosphate was announced by Flexser and Farkas two years ago. In a subsequent paper De Ritter et al. reported the biological activity of the phosphate ester and its monosodium and monodiethanolamine salts. They showed that pure preparations were fully as active as riboflavin on a molar basis for growth of L. casei, for the growth of weanling rats as determined by rat curative bioassay, and by fluorometric assay. They

Figure 1

Structural Formula of Riboflavin-5′-Phosphate Sodium



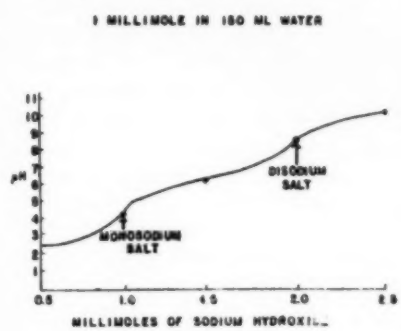
*Presented before the Research and Development Section of American Drug Manufacturers' Association, November 5, 1953.

also reported the ester and the two salts were completely available to humans.

Linkage only at the 5′ or end position in the ribose chain is essential for full biological activity. Phosphorylation is shown at this position in the slide. The theoretical riboflavin content of this molecule is 73 per cent. Tentative specification of the Roche commercial product is 70 per cent minimum as determined by fluorometric assay or microbiological assay.

Figure 2

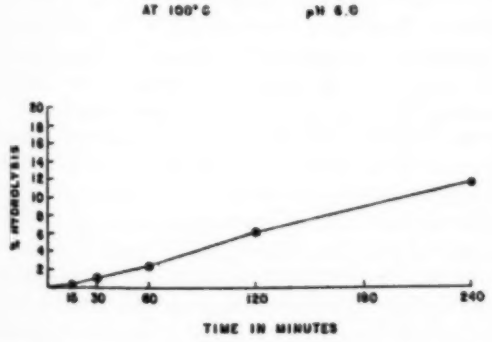
Potentiometric Titration Curve of Riboflavin-5′-Phosphate Sodium



The stoichiometric point of the monosodium salt of riboflavin-5′-phosphate as determined by the potentiometric titration curve is 4.5. The curve presented clearly shows that one millimol of sodium hydroxide unites with the equivalent of the free ester resulting in the first break of the curve at pH 4.5 and a similar elevation occurs when twice as much alkali has combined with one millimol of the free ester. Commercial production may have a pH of 5.0-6.0 because of a small amount of the disodium salt.

Figure 3

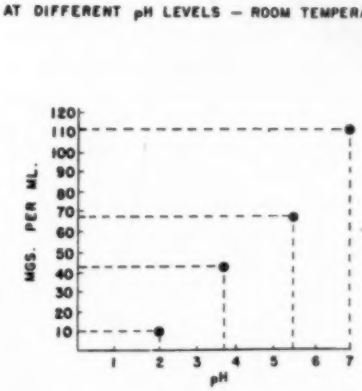
Ester Hydrolysis of Riboflavin-5′-Phosphate Sodium



Remembering that this highly soluble form of vitamin B_2 is an ester it may be anticipated that it will undergo hydrolysis, a typical characteristic of esters. Actually such hydrolysis even under rigorous tests is minimum. Inspection of the data in the curve shows that in a solution with pH 6.0 maintained at a boiling temperature for an hour the degree of hydrolysis is less than 2.5 per cent. After four hours of continuous boiling the amount hydrolyzed is a little less than 12 per cent. These data are perhaps more of academic interest than of practical meaning since parenteral solutions including B_2 are rarely heat sterilized. Furthermore, the ease with which riboflavin-5′-phosphate sodium is dissolved removes any need for long and tedious heating procedures usually employed in solubilizing riboflavin. With aseptic methods and room temperature storage the riboflavin-5′-phosphate molecule can be expected to remain in solution without any hydrolytic cleavage.

Figure 4

Solubility of Riboflavin-5′-Phosphate Sodium



These data show that the solubility of B_2 phosphate sodium depends on hydrogen ion concentration. Points plotted on the graph show the highly purified sodium salt has a solubility at room temperature of about 43 mg. per cc. at pH 3.8, about 68 mg. at pH 5.6, and 112 mg. at pH 6.9. The presence of small amounts of diphosphate ester compounds and unesterified riboflavin exert their influence on complete solubility. This influence is, however, not a factor in solutions containing realistic and practical levels of B_2 phosphate sodium. To illustrate: at pH 5.0-6.0 the solubility of the Roche product, which contains one to two per cent unesterified riboflavin is above 30 mg. per cc. This represents 21 mg. riboflavin based on the molecular equivalent.

It may be useful to note that the solubility of riboflavin U.S.P. (approx. 0.12 mg. per ml.) inserted on this graph would fall just above the baseline.

Table 1

Solubility of Riboflavin-5′-Phosphate Sodium and the Riboflavin Equivalents

	RIBOFLAVIN-5′-PHOSPHATE SODIUM	RIBOFLAVIN EQUIVALENT
pH	Mgs. Per cc.	Mgs. Per cc.
3.8	43	30
5.6	68	47
6.9	112	78

These data in Table 1 show not only the solubilities plotted on the previous graph but also give the approxi-

(*Continued on page 283*)

Psychometric Evaluation of Lipsticks*

by Noel Schwartz and Dean Foster

UNITED STATES TESTING CO.

For many years, the United States Testing Company has been concerned with cosmetic evaluations. In the past, such activity was confined to the chemical laboratories, while the measurement of consumer attitudes was left to others. Two years ago, a new laboratory was formed at the Testing Company—the Psychometric Laboratory. Psychometrics, as the name implies, is a method of testing which employs panels of human subjects in place of the typical laboratory apparatus long associated with the testing business. In recent years, a great many research organizations have devoted their attention to the measurement of consumer products with the aid of consumers, and it is the purpose of this paper to discuss our methods in general, as applied to lipsticks in particular.

As you are well aware, lipstick marketing has in the past been cyclical in nature; moving from concentrations of interest in "indelibility," "non-smear," and "kiss-proof" properties to interest in "high fashion," the hedonic or pleasantness qualities. This shift has taken place some two or three times in the past twenty years, and at present we are in a transitional period between these peaks of emphasis. Since indelibility is currently of dominant interest as compared with high fashion, we shall begin our report with the former as a means of describing psychometric techniques.

First, I should point out that our experience in the field of lipstick compounding and manufacture is limited. We understand to some extent the contribution of the bromine dyes to indelibility, but precise information as to formulae and their effect on indelibility is apart from our immediate field of activity. Other areas of the company are well equipped for these chemical analyses, and the psychometric laboratory therefore has confined its testing to indelibility as measured during actual use.

*Presented before Scientific Section, Toilet Goods Association, Dec. 9, 1953.

You may at this point be wondering how our services differ from the usual market research operation, or from the evaluations made in your own plant's quality control or development laboratory. Typically, if a manufacturer is interested in assessing the relative indelibility of his own lipstick as compared with three or four competitors, he has two alternatives open to him. He may first elect to test the products in his own plant or ad agency. Here, a test panel of five to 100 women may be selected. In most cases they are not naive, in an experimental sense. Usually they can recognize the boss's product by its color, odor, taste, or rumor emanating from the typist who prepared the list. If by some fortunate set of circumstances they happen to be experimentally naive, and will remain so, they are then furnished with the test sticks and instructed in their use—generally limited to blottings, etc. The determinations of wear are then made in any one of a variety of chaotic ways. The laboratory director and his assistant may request that each subject present herself at 1:00 p.m. for examination. Upon her appearance, a set of complex rating blanks are then pressed into use. How is the lipstick outline—is it bad, poor, etc. What about "bleeding," the "corners," how much of the "mass" remains, the "fringes?" Did it last through lunch? Did it cake? Is it a 93 score or an 87? Out of this mass of data there slowly arises a picture of relative wear or indelibility far removed from the immediate or eventual criteria of the consumer. While all of these isolated parts may go into the final description of a lipstick, it is our feeling, based on a review of work being done in a number of laboratories other than our own, that a more meaningful, sensitive, and reliable sets of data may be obtained with far less showmanship and manipulation.

But back to our harried manufacturer. If he chooses to take his problem out of his own organization, he then has the possibility of turning it over to a market survey or research group. Here an indelibility determination will usually be made as follows. Ten thousand women across the country will receive one morning by mail, two coded lipsticks. They are instructed to wear each one and then report which of the two wears better. This approach often leaves little room for criticism, since it is merely an enlargement of a sound laboratory type of study. But why 10,000 women—why not 20 or 50? Generally the client insists on a large group and, to paraphrase a venerable man who never set brushless lather to his face, "Damn the cost and inaccuracy, full speed ahead!" Aside from the cost involved in sampling 10,000 women, the likelihood of errors becomes enormous. Most frequently, the questionnaires are returned before or long after the products are used. Then, of course, there are the women who, wishing to remain part of a mailing population but not willing to wear an unsuitable lipstick color, choose a sample at random as the "best" and chuck them both into the trash without a second glance. Thus it can readily be seen that the mortality rate in the broadcast approach is high, and the cost of burial even higher.

But at this point you may say, "What has psychometrics to offer besides criticism and confusion?" So that we may best present our methods and the points at which they mesh and differ with current procedures, we have elected to present, by way of illustration, two studies conducted in our laboratories. The first problem concerns indelibility, and I will only discuss it briefly. The second problem is one of consumer motivation, and here the presentation will be more detailed.

Indelibility Determination

For the indelibility determinations, we first selected a panel of 40 women. Why 40, you may ask. First, I should point out that we had four lipsticks to evaluate, and 40 is readily divisible by four. This then gave us us four groups of ten women each, who were to wear each of the test lipsticks during four test weeks. Twenty is divisible by four, and so are 16 and 8, but experience has shown us that, where gross differences exist in products of this type, a panel of 40 subjects is adequate for demonstrating this difference. If the differences are subtle, it may be necessary for us to enlarge our panel to 60 or 80 women, but from the data obtained with the initial panel it is possible to measure the strength of any developing trends, and thus decide whether or not an enlargement is warranted on a sound statistical basis.

We then select a single rating scale, in this case a five-point wear scale, which has been found to yield valid and reliable results. Lipstick use is then randomly assigned to our test subjects and the program is ready to begin. We select a rating or judging panel of 20 to 30 women, again depending on the magnitude of the differences between the sticks, and they are familiarized with the use of the scale. At a given time on each test day, the group meets. The lips of each subject are examined by each of the judges individually, no consultation or discussion permitted, and within a short period of time we have obtained 200 ratings for each of the lipsticks or 800 ratings for the test period. Twenty test days results in a grand total of 16,000 ratings, or 4,000 ratings per lipstick.

From this volume of data it is possible to measure, in addition to the relative indelibility or resistance to wear, the inter- and intra-differences between the subjects and lipsticks.

Just one more point before we go on to discuss the motivation problem. At the same time we obtained the panel wear ratings, we also made a series of Kodachrome transparencies which provided us with a permanent record of the test results. As a reliability check on both the judges and the scale, we projected the slides and had them rated by another panel of observers. We found that the results obtained with the projected images did not differ significantly from those obtained during the direct ratings.

In brief then, with a relatively small panel of subjects, we were able to demonstrate significant differences between lipsticks with regard to indelibility. Further,

(Continued on page 277)

Cholesterol

by Edgar S. Lower

TECHNICAL ADVISER, CRODA INCORPORATED

part three . . .

(a)

Pharmacology of Cholesterol

(b)

Cholesterol Derivatives

COURTESY AMERICAN CHOLESTEROL PRODUCTS INC.

Cholesterol is an integral part of animal cells and is considered to be a "mother substance" to certain vitamins and hormones. In living organisms it is recognized as an important material in the sub-epidermal layers and other parts of the body. It represents an indispensable protective substance, and an insulating Medium for the central nervous system.[57]

It is synthesized and destroyed in the body, where most tissues are capable of its synthesis, and work with deuterium oxide in the study of the metabolism of cholesterol suggests that this is built up in the body from small molecules and not from the sterols.[64,92] Healthy individuals excrete 2.5/4.0 mgms. per day.[64,92,145]

The following table shows the concentration of cholesterol in various species, in mgms. per 100 ml. or 100 grams of tissue.

Species	Plasma	Red Cells	Whole Body
Mouse	—	—	300
Rat	52	—	200
Guinea Pig	32	100	—
Rabbit	50	120	120
Cat	93	—	150
Chicken	100	135	—
Dog	150	140	—
Sheep	70	145	—
Hog	120	120	—
Cow	110	110	—
Horse	83	122	—
Human	200	140	—

It is generally not nourishing to the organism and thus does not take part in general cell metabolism. Any excess, therefore, is excreted unchanged principally through the bile. Early reference to the pharmacology of cholesterol suggests that it increases the tonus of the heart and muscles.[202]

Employment of cholesterol in medicine includes its internal application for treatment for pernicious anaemia, haemolytic jaundice, haemoglobinurea, blackwater fever and enteritis. It is also employed in the treament of pulmonary tuberculosis. For the latter purpose a composition of 0.05 grams cholesterol, 0.20 grams camphor, 0.05 grams guaicol, 0.05 grams quinine and olive oil to 2 milliliters is marketed for intramuscular injection.[142]

Its action is both antiseptic and antitoxic and it is known to act, at least in *vivo*, as a neutralizing substance to a number of different poisons, such as saponin, tentanolysin and snake venoms. Detoxication of diptheria toxin is also claimed to be produced by cholesterol.[43,149,158]

Cholesterol also neutralizes the haemolytic activity of streptolysin O, has a haemolytic action on the pneumococcus and a strong inhibitory action on the lipolytic enzymes, and may thus help to regulate lipoid digestion within the cells.

Riboflavin-cholesterol pellets have been utilized for treatment of riboflavin deficiency in man.[155]

The length and depth of anaesthesia produced by various anaesthetic agents such as ether, chloroform, urethane, etc. has been found to be greatly increased

by previous intraperitonel injection of cholesterol. It also intensifies the action in dogs of pentathol sodium.[15-51]

Cholesterol is used in the manufacture of artificial bile, employed for the making of remedies for treating various diseases. It enters into the preparation of pharmaceutical preparations for injections into muscular systems, or subcutaneously.

These latter consist of the incorporation of active substances with aqueous emulsion of lipoids, antiseptics, regulators and stabilizers, giving a system capable of holding any desired doses of medicaments, but able to release these over any desired space of time gradually, so that large doses of medicament may be administered without detriment to the organisms. In such a system, cholesterol acts as a regulator, retarding the release of the medicaments.

A similar patented preparation consists of olive oil 25 parts, water 20 parts, sodium oleate 1.5 parts, myricin 1.5 parts, cholesterol 1.5 parts.

Products useful in the treatment of leprosy have been prepared by the esterification of cholesterol with acids of the chaulmoogric type.

Given examples are: (1) The preparing of the chaulmoogric acid cholesterol ester by heating the components together in an atmosphere of carbon dioxide, or by efluxing the chloride of the acid with cholesterol in xylene solution. (2) Hydnocarpic acid esters, prepared by heating the components and passing carbon dioxide through the mixture.

COURTESY OF AMERICAN CHOLESTEROL PRODUCTS INC.

Good results have been obtained by treatment of leprosy with colloidal suspensions of chaulmoogric extracts in conjunction with cholesterol and with chaulmoogric and hydrocarpic acid ester of diethylthanolamine, which have been treated, as hydrochloric acid salts, with mol. equivalents of cholesterol.[65-66]

Hair Treatment

A connection has been shown to exist between cholesterol metabolism and hair growth in living organisms, and if there are constitutional disturbances of the organisms due to illness, there results a cholesterol deficiency of the sebaceous glands, and growth of the hair is affected, bringing about its loss.

Abnormal fat secretions, which are the cause of the trouble, congest the pores of the scalp by scurf formation, the horny or greasy deposit of sebum which hinders nutrition of the hair.

Application of cholesterol is said to restore this situation to normal by its regenerative action on the hair papillae removing scurf and promoting hair growth on the head but not elsewhere.

Cholesterol is reported to prevent this secretion via reconstruction of atrophied hair, whilst other reports claim that cholesterol has no action on the hair growth, although it is acknowledged as a useful anti-irritant in alcoholic tonics.

It is reported to have powerful curative properties in seborrhoea and is used in proportions around one to two per cent.

Dandruff and scales are said to disappear in fourteen days with chronic cases requiring a month or so.[23-141]

In psoriasis, the cholesterol content of the healthy portion of the skin is 0.08-0.13 mgms. per cent, but is as much as 0.46 mgms. per cent in regions immediately close to the lesions.

One cholesterol preparation resulting from an attempt to combine the older sulfur treatment, is sulfur-cholesterol, produced by mixing an equal quantity of the sterol and sulfur together, with double the quantity of glycerine, and heating to 200-220° C. The mass is then allowed to cool to room temperature, being stirred all the time. Uncombined sulfur is separated by extracting the mixture with a suitable solvent.[24]

Cholesterol in alcohol solution, containing also oleyl alcohol and glyceryl monostearate has been used as a hair tonic. It may also prove useful in allaying the irritating effects of certain powerful stimulants often included in hair tonics and may be employed to advantage in hair dyes.[38]

The cholesterol used in hair tonics may be irradiated, but there are recommendations that hair lotions themselves should not be exposed in the air, in order to avoid deterioration.

(*Continued on page 294*)

IMPULSE APPEAL

Vibrant color . . . the sensory appeal of warm lightness . . . the promise of convenience . . .
THAT'S THE PLAXPAK® BOTTLE.

PLAX

USE APPEAL

The infinite ease of a one-hand squeeze . . . the perfect safety of unbreakability . . .
THAT'S THE PLAXPAK BOTTLE.

PLAX

PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES • PLAXPAK BOTTLES

REPEAT APPEAL

A magnet at the point-of-purchase . . . an aid to your product at the point-of-use . . . it sells, then resells . . .
THAT'S THE PLAXPAK BOTTLE.

PLAX

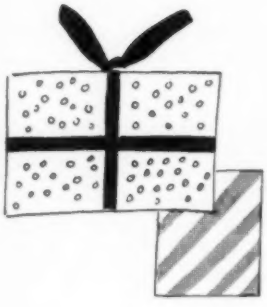
The Plaxpak polyethylene bottle is packed with merchandising magic. And Plax alone has the experience to exploit this magic to its fullest in behalf of your product. Our packaging staff is at your service —
For packaging that sells at the point-of-sale and resells at the point-of-use.

PLAX CORPORATION

PLAX

WEST HARTFORD, CONNECTICUT

Plax Canada, Ltd., Montreal and Toronto



Packaging and Selling

NO MORE MISTAKES

Let's call this year, 1954, the year in which business will have to pay for its mistakes. For nearly ten years because of an expanding population, an expanding economy and a scramble by buyers for goods, business has been able to make almost any mistake in the book and get away with it without punishment. This year, 1954, doesn't look as if it will be that kind of a year. It not only will not be smart to make many mistakes in 1954, it might be suicide.

Here are some of the mistakes that in our opinion and our observation have been pretty general during the last several years.

Distribution

Many businessmen have forgotten that there is a logical and definite pattern of distribution for every product depending upon its price and its character and for every company depending upon the kind of a personality it wishes to create. Many businesses have so confused this pattern of distribution that both their companies and their products lack any distinct and vivid individuality in the mind of both the retailer and the consumer.

Overexpansion of distribution has been a primary mistake. That is, believing that merely filling a pipeline is creating a demand. The lure of the super-market has led many people into a serious position in this one mistake.

Dilution of distribution is another phase of overexpansion that will probably catch up with some manufacturers. These folks have reached the point of dilution in distribution where a high percentage of the retailers are not selling enough of their product to care whether it is in their store or not and where the smart retailers are approaching the point where they will kick the product out because it does not pay its board in sales per square foot.

Some manufacturers have built up a distribution that they are simply not competent to maintain. This may be the variety store, which has its own peculiar problems, sales contacts and type of advertising. Or it may be the mass drugstores which means mass advertising and an effective wholesale druggist setup. Or it may mean the grocery super-market where they are really up against the giants in package merchandising, and where they are up against a tough bunch of retailers who are already encountering cut-throat competition and tough sledding and where it takes an enormous consumer sales volume to hold the kind of a display space that means survival.

Of all the problems and mistakes in distribution, we believe that the biggest heartaches are going to come to some of the people who entered the grocery super-market believing that this meant automatically a big enormous plus in consumption for their product.

The Product

During the last several years more products have been put on the market through impulse and imagination than by good product research and good market research. This has been a period where manufacturers have rushed to market almost everything in which some competitor seemed to have a little success. The products that they have used to jump this market have, in many instances, been hastily conceived to meet a speculative or a temporary demand. An appalling number of tongue-in-cheek products have been dumped on the market in the last ten years in a burst of opportunistic enthusiasm.

Packaging

To a big extent, packaging has been a competition of gadgets. There has been a trend to emphasize the package instead of the product. In fact many manufacturers have invested their time and their money and the future of their business in the belief that the consumer will continue to buy a package almost regardless of the product. The original idea that a package is something to safely and economically transfer the product from the manufacturer to the consumer and to afford convenient dispensing and protection has been lost sight of by many manufacturers in an implicit belief that a trick or unique or artistic package is the basis upon which to build a business. The recent example of the liquor industry in walking with their eyes wide open into the same trap which harasses the perfume business is an excellent example of what we mean here.

Advertising and Merchandising

Perhaps here is where the most serious mistakes have been made in this industry in the last few years.

This industry, the proprietary and the cosmetic manufacturers, in many instances, has been a primary contributor with the cigarette industry and with the garden supplies industry in convincing the public that only children and morons believe an advertising statement. This discrediting of advertising is just beginning to smack the cigarette people in the face and it is due very much to turn around and smack certain parts of the cosmetic and proprietary people just as vigorously.

This industry is about to pay a punishing price for over promotion. They have over-promoted products, which had a good chance for a moderate sustained volume, to a point where the public can hardly believe that a product which sells at intervals for half price or which has tied to it an extravagant premium is worth buying unless it is offered at a price which can mean little or no profit to the manufacturer. Many manufacturers who have had one or two good products, with retailer and consumer acceptances and with a good growth potential have let these products drift while they concentrated their advertising and marketing on dogs for which there was every evidence that neither the public nor the retailer wanted and which time proved that neither would take for very long.

This industry is paying far too much for distribution, which means that in very many cases the consumer is far from getting their money's worth. This ought to mean, in the kind of period we are entering, some very violent upsets. We just don't understand why the kind of retail operation which can operate at about 18 per cent of sales should be content to operate on equal terms with a retail operation that takes about 30 per cent of sales or that this group should in turn be such perfect gentlemen with another group that requires 38 per cent of sales to break even.

Beginning in this year 1954 we have a hunch that business will begin to return to a degree of integrity that has been far from universal in the last ten years. By that we mean an integrity of product, an integrity of advertising, an integrity in the conception which forms the individuality of a company and an integrity in business policy which is thinking in terms of long-range growth rather than opportunism.

Among Those Seen!

According to experts, there are now about 5,000 items in a modern super-market as compared to 1,000 in 1939. Has this 50 per cent increase come about because self-service may have an unlimited ability to expand as compared to a limited ability in personal selling? At any rate, the growth in the diversity of products, the number of competing brands and the tendency of many manufacturers to produce everything in the field is certainly loading every branch of the retail trade. Quite a few manufacturers of moderately well-known brands do not realize, in their pride and ignorance, that in many stores where they have distribution according to their books, few of the sales people know that their product is even in the store. Education and sales training of the sales clerk is probably one of the most important and critical marketing problems of the next few years.

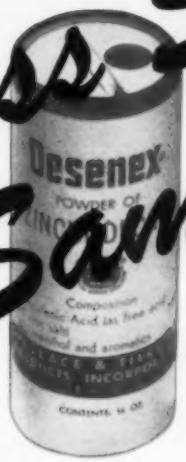
Odor Foam

Cologne foam, a fragrance suspended in a propellant, is a new ribbon stick product that has interesting possibilities. It is stated that the cologne foam odor will outlast by hours an alcohol based toilet water. These are the characteristics that has made the cream and lotion sachet an interesting fragrance carrier.

The fragrance industry has been waiting with great interest to see what would be the successor to the cologne stick. With the exception of one leading brand, the cream or liquid sachet does not seem to be measuring up to this potential. Perhaps this aerosol dispensed lotion, heavily laden with fragrance, will prove an active contender.

Today's Modern Sampler

Cross Swing Sifter Sampler



MADE IN LARGE SIZES, TOO

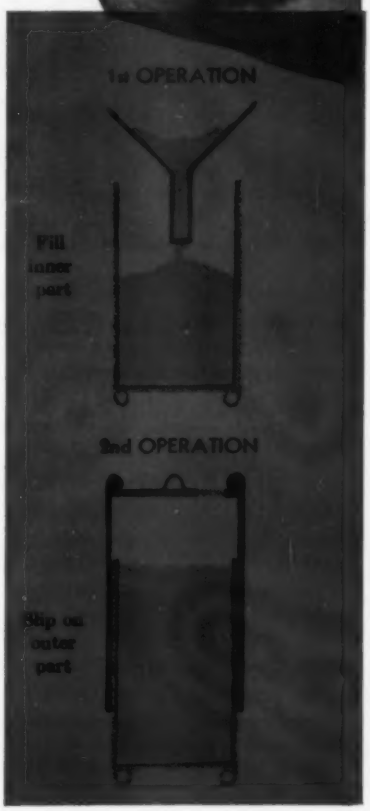
So good for sales! So easy to fill!

In the face of current selling conditions, distribution of product samples is rapidly becoming a necessity. And these Cross round miniatures provide the modern answer for the perfect sampling container.

Dressed as an exact replica of your full size container, patented Cross Swing Sifter Samplers are sure-fire for sampling all sorts of powders such as cosmetics, food, drugs, pharmaceuticals and anything else that can be dispensed through a shaker or a sifter.

LOW COST FILLING

Almost any standard filling equipment can be used to fill Cros Samplers. Just fill the inner section, and then slip the outer part over it. Then a simple twist of the top, and your product flows freely.



Ask for a representative to show you samples and discuss your problems.

CROSS PAPER PRODUCTS CORP.

4377 Bronx Boulevard New York 66, New York

DESIGNERS • CREATORS • MANUFACTURERS OF INDIVIDUALIZED ROUND AND OVAL PACKAGES

EVERY Rx IS A "WONDER DRUG" TO SOMEONE

Opticlear VIALS

MUCH has been said and written about the new "wonder drugs" developed by our country's great pharmaceutical laboratories. You see many of them coming to you in Kimble Opticlear Vials . . . fit containers for such fine products.

Every Rx that stops pain or cures illness is a "wonder drug" to its user—a "wonder drug" formulated by your professional skill and ethical standards. Give your "wonder drugs" the classic purity of line, clarity of vision, and moisture-vapor protection only found in Kimble Opticlear Vials.

• • •

For samples, sizes and prices consult your wholesaler's representative.

KIMBLE OPTICLEAR VIALS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

Salesmen

Salesmen are not born salesmen but are made that way. That is the conclusion of 140 manufacturers reporting to the National Industrial Conference Board.

That is a subject that could be debated endlessly, in our opinion, with plenty of people ready to toss the coin and take either side of the argument. The truth is the salesman is a salesman . . .

Things That May Come

There is a little flurry of a trade war in Holland. We don't want to say that coming events cast their shadows before them, but a lot of trade practices in this country indicate that it could happen here.

This trade war was started by 1,600 chain grocery stores. It seems that these chains, faced by stiff competition in food prices, started to offer bed sheets as gifts to customers. This was so successful a come-on that over 12,000 sheets a week were sliding over the grocery counters. When a demand by textile retailers that the practice be stopped was ignored, the textile retailers came up with the idea to give coupons to their own customers for groceries which could be procured in grocery stores that were not handling the bed sheets. As might be expected, there is now heavy pressure on the Government to introduce a bill to regulate the gift and rebate system.

Color and Odor

Products with an odor appeal will benefit by color TV, according to Dr. Ernest Dichter, of the Institute for Research in Mass Motivations. According to the doctor, color and olfaction go hand in hand. Maybe the doctor has an idea worth pursuing.

Excellent

Six cosmetic companies have been termed "excellently managed" for 1953 by the American Institute of Management. These firms are Bristol-Meyers Company, Colgate-Palmolive, Johnson & Johnson, the Gillette Company, Procter & Gamble and Sterling Drug.

Who Buys

Sometime during last year there was a lot of excitement aroused by the discovery that a much higher percentage of men were shopping in super-markets than anyone suspected and in addition that men were much more inclined to trade up, to spend more money and fall more readily for impulse purchases than women. This brought about a lot of discussion on the advisability of directing more advertising to men and one large food chain started an experimental test in this direction. Now we hear of a new research program which shows that 25 per cent of family food buying is done by teenagers. This ought to settle the marketing research questions once and for all. Apparently just about everybody buys food.

How About Co-Op Advertising?

The Supreme Court has just rendered a decision on what is called Parallelism. What this means is that when several manufacturers take consciously parallel action this may not mean a violation of the Sherman Act.

What interests us in regard to this decision is the recognition by the court that retailers, or distributors in primary traffic sections have advantages to manufacturers over retailers in smaller towns or sections which the manufacturer is entitled to recognize.

Whether this thinking can be stretched to cover the use of demonstrators and cooperative advertising under the Robinson-Patman Act, we wouldn't pretend to guess but there does seem a "parallelism."

The substance of this case is that a movie theatre owner in a suburb of Baltimore wanted first-run films. He charged that eight major film producers conspired in violation of the Anti-Trust laws in their policy of granting first-run films only to downtown theatres.

In this seven-to-one decision, Justice Clark said there was no direct evidence of illegal agreement among the distributors. Justice Clark added: "However, an exclusive license would be economically unsound because the Crest is a suburban theatre, located in a small shopping center, and served by limited public transportation facilities; and with a drawing area of less than one-tenth of a downtown theatre it cannot compare with those easily accessible theatres in the power to draw patrons.

"Hence, the downtown theatre offers far greater opportunity for the widespread advertising and exploitation of newly released features, which is thought necessary to maximize the overall return from subsequent runs as well as first runs."

It seems to us if we substitute the words "downtown Department store" for "downtown theatre" that maybe this decision will have some future bearing on the application of the Robinson-Patman Act to such things as cooperative advertising.

Gifts Should Be Bigger

It has been remarked before that the cosmetic industry is letting its premier position in gift sales slip away from it. Days such as Easter, Mother's Day, Father's Day, etc. that used to be periods of active industry-wide promotions and special packaging now pass by with hardly a ripple.

According to Irving Edwards, Executive Director of the National Mother's Day Committee, "There are many more entries in the bidding for the consumer gift dollar in 1954. They are expected to top 360 million dollars with an average of $12.00 being spent by each of thirty million families.

While Mother's Day may be the biggest gift occasion

"Quality assurance is what every consumer wants in a pharmaceutical preparation. We at *Massengill* put the utmost quality into every one of our products —and then we reflect that quality in our packages. That's why they're all sealed with a Du Pont 'Cel-O-Seal' band, printed with the S. E. Massengill trade mark."

—says Mr. D. W. Massengill, Purchasing Agent, The S. E. Massengill Company

Eye-catching "Cel-O-Seal" bands will work for your product, too! They hold closures tight, guard against tampering and spillage, inspire consumer confidence. And a "Cel-O-Seal" band on the neck of your bottle is a sure way of getting across your sales message or slogan.

FREE PACKAGING SERVICE: See what "Cel-O-Seal" can do for your package. Send us a labeled dummy bottle. Our package experts will band it, return it for your inspection. No obligation, of course. Write: E. I. du Pont de Nemours & Co. (Inc.), "Cel-O-Seal" Section, 9529 Nemours Building, Wilmington 98, Delaware.

"Cel-O-Seal" cellulose bands are also sold by Armstrong Cork Co., Lancaster, Pa., and on the West Coast by I. F. Schnier Co., San Francisco, California.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

DU PONT Cel-O-Seal Bands

REG. U.S. PAT. OFF.

after Christmas there are still plenty of opportunities slipping by each month. For instance, every month there is an average of nine million birthdays, three million anniversaries, four hundred thousand showers and one hundred fifty thousand weddings.

Cosmetics Are There

An increasing number of non-food displays could be seen at the recent Convention of the National-American Wholesale Grocers Association. Several of these non-food displays included toilet articles.

More Sales Reps. Needed

In this era of heavy competitive selling and burdensome selling expenses, many small and medium-sized manufacturers will find themselves at a disadvantage and perhaps in a hazardous position, unless they can find established manufacturers' sales representatives or local independent salesmen operating with several non-competing sales lines.

These small manufacturers are finding it increasingly impossible to have their own men travel or be represented in many sales territories.

The advantage of the independent sales representative is that the cost of selling is a fixed percentage which the small manufacturer can operate on, and the fact that these men are usually above average in ability, willingness to work and acquaintance through their territory. Even the manufacturer tending toward the larger classification in volume should find men of this sort increasingly attractive in certain territories. The tendency of many manufacturers to increase the scope of their line, including products which have no real justification in their line, in order to give the salesman a better income is uneconomic and is probably due for pretty hard sledding.

Changing Cosmetics

Fawcett Women's Groups' Thirteenth Annual Beauty Reader Forum will show some rapid changes in cosmetic usage pattern among younger women.

Indelible lipsticks will show a 42 per cent increase in usage over 1952; liquid rouge has better than doubled in popularity during that period. Neutralizing waves now control 25 per cent of the market.

Hold on to Your Hats, Boys

A jeweler in a small Arkansas town recently pushed aside the jewelry in his window to make room for a coffee display. The coffee was advertised at 88c a pound, 20c under the price of a nearby super-market. "Business is great" said this jeweler, "I sold 50 lbs. yesterday."

"The super-markets are selling watches and costume jewelry so I guess it is all right for me to sell coffee."

Caveat Coffee

There are three basic situations that stimulate research. One is War, another is shortages and a third is high prices.

We wonder if the coffee people realize how thoroughly they are stimulating flavor research to isolate the synthetic aromatic constituents in the coffee flavor oils.

Here We Go Again

In a survey, 100 leading business and professional leaders were virtually unanimous in their opinion that the television commercial is "disgraceful, irritating, absurd, exaggerated, banal, puerile, ranting, annoying, boring and insulting to the viewers' intellect. Evidently, business leaders don't like commercials.

Increase for Food Stores

Along the Pacific Coast, food stores have been much more active in expanding into non-food lines than in the East. Here is the way the Seattle Times reports the number of families who purchase some drugs and toiletries in food stores:

YEAR	PER CENT
1953	56.2
1952	46.9
1951	32.6
1948	31.2

Ups and Downs for Cosmetics

Dell Modern Groups' Eighteenth survey of Beauty gives some significant information regarding the ebb and flow of cosmetic usage. It has been evident for several years that certain products such as face cream, tooth powder, nail enamel and rouge have been declining in usage. In some of these products, such as face powder, an obvious reason for decline has been the increasing use of other forms of makeup performing the same function as face powder. Some of these increases and decreases in cosmetic usage should merit very careful study by the cosmetic industry because in this period, that is, from 1951-1953, America has surged forward in population and in per capita wealth as at no other time in its history. Certainly, any decline in sales cannot be attributed to lack of purchasing power.

Per Cent of use UP since 1951 and in 1953

Product	*1953*	*1951*
Face powder (cake)	25.6%	16.9%
Liquid make-up base	21.3	12.1
Cream rouge	18.1	13.6
Bob pins	87.2	85.4
Home permanents	41.2	38.4
Hand cream	30.4	28.1
Tooth paste	91.5	85.8
Spray deodorants	24.9	16.1
Internal deodorants	8.9	6.7
Deodorant soaps	23.9	21.1
Depilatories	6.6	4.2
Stick cologne	35.9	15.7

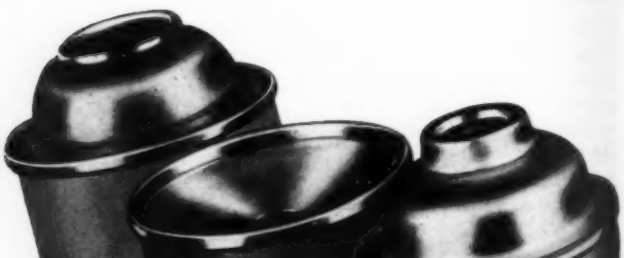
Per Cent of use DOWN since 1951

Product	*1953*	*1951*
Face powder (loose)	55.6%	62.4%
Creamy cake make-up base	9.7	11.3
Tinted cake make-up base	7.2	9.5
Cake rouge	23.4	30.7
Vanishing or foundation cream	13.8	15.9
Cleansing, all purpose cold cream	65.4	70.0
Hair oil	8.6	13.3
Cream shampoo	33.8	38.4
Liquid shampoo	50.9	62.5
Nail polish	64.5	65.7
Tooth powder	11.3	18.7

Not one . . . . . .

or two . . . . . .

but THREE



A Continental aerosol can is tailor-made for you!

If yours is a sprayable product in the non-food field, you'll find that one of these *three styles of aerosol cans* could have been designed especially for you. As part of Continental's Tailor-Made Package Service, we'll deliver all of these cans you can use, any time you want them. Individualized engineering and fine lithography are available, and — if you wish — contacts with valve suppliers and commercial fillers. Why not give us a chance to work with you—not just as suppliers, but as interested counselors and friends.

DOME TOP — Domes attached and equipped with standard 1" curled opening for all popular valves. Regular (12 oz.) or Midget (6 oz.).

CONCAVE TOP — Tops furnished loose and perforated with hole-punch for specified aerosol valves. Regular (12 oz.) or Midget (6 oz.).

DOME TOP—Domes furnished loose and perforated with hole-punch for specified aerosol valves. Regular (12 oz.) or Midget (6 oz.).

CONTINENTAL CAN COMPANY

Continental Can Building • 100 East 42nd Street, New York 17, N.Y.

EASTERN DIV.: 100 E. 42nd ST., NEW YORK 17 • CENTRAL DIV.: 135 SO. LA SALLE ST., CHICAGO 3 • PACIFIC DIV.: RUSS BUILDING, SAN FRANCISCO 4

TAILOR-MADE PACKAGE SERVICE

Doings

Lanostik Corp., Ridgewood, N. J., is introducing its new camphorated lanolin stick in a self-serve display carton designed and made by the American Coating Mills division of Robert Gair Co.

Shulton is now selling a new, pure rhodinol at approximately half the price of the traditional Geranium Bourbon rhodinol. Marketed under the name, "Rhodinol Shulton," this product is a true rhodinol which possesses a full, rich, typically red-rose note and the warm, spicy character usually associated with rhodinol made of the finest Geranium Bourbon Oil. It can replace the natural material in perfume compositions.

Geratric Pharmaceutical Corp., 45 Commonwealth Boulevard, Bellerose, N. Y., is distributing Geritinic Capsules, for getting the iron out of the blood plasma into the red blood cells, thereby making hemoglobin. It is especially indicated in nutritional anemias and for cardiac, obstetrical, arthritic and geriatric patients.

Lilly has announced an intravenous form of its wide-range antibiotic, Ilotycin which is indicated in infections caused by gram-positive bacteria, by rickettsiae, and by large viruses. It is especially recommended for patients unable to take medication orally, or in infections so serious as to require an almost immediate therapeutic effect.

Shulton is offering a Spring special of a smartly decorated Desert Flower gift set containing a free purse-size bottle of Desert Flower Hand and Body Lotion with a regular 3½-ounce bottle of Desert Flower Toilet Water for the standard price of the toilet water alone—$1.50 retail.

Lederle Laboratories has placed a new skin test antigen for mumps on the market. The antigen, made from the allantoic fluid of chick embryos infected with mumps virus, may serve to indicate whether a patient is or is not immune to the disease. The antigen is injected into the skin of the forearm, and a positive reaction will form a red weal within 48 hours. A positive reaction indicates a past infection with the virus and also indicates that the patient is now resistant to the virus.

Nestle-LeMur Co. is offering special consumer deals on their Djer-Kiss and Mavis lines in order to enable retailers to take full advantage of the spring talcum powder season. A flacon of Djer-Kiss perfume, valued at $1 retail, will accompany free every 59-cent size of Djer-Kiss talcum powder sold at the regular price. The special Mavis deal offers customers the large 59-cent can of Mavis talcum powder for 39 cents.

Abbott Laboratories has prepared Pleasant, a wine-flavored appetite stimulant and nutritional supplement especially useful in aiding appetite failures resulting from the inactivity of old age and the languor of convalescence.

Johnson & Johnson last month introduced Johnson's Baby Shampoo, a new product that will not burn or irritate the eyes.

Almay has a new counter display which holds 12 compacts of Soft-Lite, the new powder-press make-up. A candlelight and music illustration carries out the Soft-Lite theme.

Lederle is now marketing sugar-coated tablets of Achromycin tetracycline in bottles of sixteens. The new antibiotic was originally marketed in capsule form last November.

Dodge & Olcott has announced the preparation of Rose Bulgare Synthetic, a newly created specialty, to

Glamorize Merchandise

KING SIZE
1 ounce capacity

PURSE SIZE
½ ounce capacity

Your Stick Deodorants...
Facial and Hand Creams...
Solid Cologne... Stick Perfumes...
After Shave Lotions...

CALUMET *Swivelpak*®

the PROPEL-REPEL
AIRTIGHT, SHRINK-PROOF,
PLASTIC CONTAINER
in glorious colors and combinations

NO MOULDING REQUIRED . . . PRODUCT CAN BE POURED DIRECTLY INTO CONTAINER . . . ELIMINATES NECESSITY FOR COSTLY FOIL WRAPPING AND MESSY HANDLING.

CALUMET *Manufacturing Co., Inc.*

565 FIFTH AVENUE, NEW YORK 17, NEW YORK, MURRAY HILL 8-4270
PLANTS: NEW YORK CITY, BLOOMFIELD, N. J
IN CANADA: CALUMET DIVISION OF ERIC H. HARDMAN, LTD. 137 WELLINGTON ST., WEST, TORONTO, CANADA *PAT. PEND.

Doin's ... (CONTINUED)

be used in large proportion as an extender for the scarce natural Rose Bulgare.

Hygiene Research Inc., 684 Broadway, New York, has developed two types of ointments for protecting the skin against extreme exposure to industrial irritants: Clerex, a protective gel, which protects against organic solvents and solvent-borne irritants; and Hydrepel-A and Hydrepel-S, creams which protect against water solutions and water-borne irritants by forming adherent water-insoluble coatings on the skin that are invisible.

J. B. Roerig & Co., a division of Chas. Pfizer & Co., is marketing the new, basic broad spectrum antibiotic, tetracycline, under the trade name of Tetracyn. First dosage forms currently being made available to doctors are sugar-coated tablets, and a preparation for intravenous administration.

Pfizer Laboratories is marketing Terramycin intramuscular, the first intramuscular form of a broad spectrum antibiotic. Clinical reports, according to the company, indicate that the product is particularly valuable in treating comatose patients, very young infants and patients with inaccessible or thrombosed veins.

Wyeth has introduced Ethobral, a triple barbiturate in capsule form for use as a hypnotic, at the discretion of the physician. Small doses of the three barbiturates (sodium secobarbital, sodium butabarbital and phenobarbital) provide prompt action, sustained sleep for six to eight hours, and virtual elimination of sedative hangover.

White Laboratories has prepared Dramicillin-300 Suspension, a highly palatable oral dosage form of potassium penicillin G. It is a stable, ready - to - use, creamy suspension, which retains its potency for two years without refrigeration.

Marcelle Cosmetics has an eye-catching counter display carton for its Satin Touch cake powder containing 12 white and gold hinged compacts, two each of six flattering shades.

Winthrop - Stearns is distributing Thenfadil-SPC, a product designed to manage all the symptoms of the common cold including allergic tissue responses.

Schieffelin & Co. has announced the availability of C-reactive Protein Antiserum (CRP Antiserum) on a commercial scale. CRP tests are the most sensitive indicator yet developed, states the company, for the detection of inflammatory processes, as in rheumatic Fever.

A. D. McKelvy Co. is offering—for a limited time—two jugs of Spiced Shave Lotion for the price of one in order to introduce this newest member of the Seaforth line to a wider audience. The two jugs are packaged together in a compact attention-getting display.

Parke, Davis & Co. has developed Milontin Kapseals, an anticonvulsant, for the relief of petit mal epilepsy. It is supplied in 0.5-gm. Kapseals in bottles of 100 and 1,000.

Nestle-LeMur Co. has arranged Nestle Colorhair, its recently introduced hair coloring, in an attractive counter display unit holding 13 packages of assorted shades of Colorhair and two packages of Nestle Lite, the non-ammonia hair lightener.

Tussy Cosmetiques will introduce Apricot Brandy, its new lipstick shade, in March, and will be available in both the regular and Permastick formulas.

CROWN SPRA-TAINER® Does It Again!

Wins Top Awards

AT C.S.M.A.
"AEROSOL FESTIVAL"

Henderize, Inc.
Sacramento, Cal.

Again in 1953 hundreds of entries competed in the package design contest at the annual "Aerosol Festival" of the Chemical Specialties Manufacturers Association in Washington, D. C. Again, SPRA-TAINER pressure packages walked away with top honors—including Grand Prize.

Look at these winners. Think! Wouldn't your product, too, win more sales in the distinctive Modern Design of SPRA-TAINER?

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Helena Rubinstein, Inc. New York, N. Y.

The Fuller Brush Co. Hartford, Conn.

Windsor Chemical Laboratories Philadelphia, Pa.

Thompson Chemicals Corp. Los Angeles, Cal.

Bridgeport Brass Co. Bridgeport, Conn.

Created by Crown to have exclusive "No Top Seam, No Side Seam" construction, SPRA-TAINER is the world's original and leading lightweight pressurized container . . . one of Crown's famous family of finest quality cans for the products of American industry. We'd be pleased to serve you.

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DIVISION
CROWN CORK & SEAL COMPANY, INC.
One of America's Largest Can Manufacturers

PHILADELPHIA • CHICAGO • ORLANDO • BALTIMORE • NEW YORK • BOSTON • ST. LOUIS

Our opal jars display to good advantage because they are exceptionally white and opaque. They can be supplied in a wide variety of sizes either plain or with fired-on ceramic labels.
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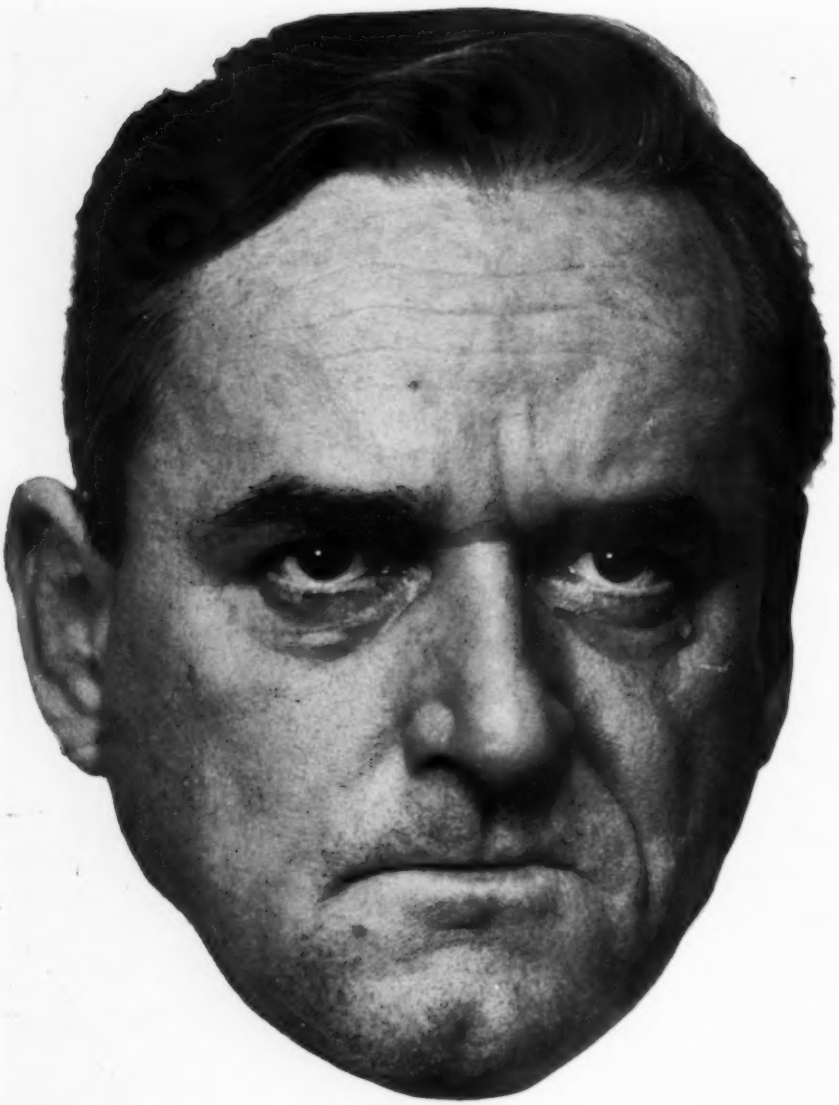
CARR-LOWREY GLASS CO.
Designers and manufacturers of fine glass containers
Factory and Main Office: BALTIMORE 3, MD. • New York Office: 40 W. FORTIETH ST. • Chicago Office: 1572 MERCHANDISE MART



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Houston 19, Texas—R. P. Anderson Co., 5643 Overbrook Lane
Dallas 2, Texas—R. P. Anderson Co., 1122 Texas Bank Building
St. Paul 1, Minnesota—Alexander Seymour, 712 Pioneer Building
West Coast—Wm. J. Stoepker, 301 E. Colorado, Arcadia, California
Canada—Sun Tube Corp., 145 Spruce Street, Ottowa, Ontario
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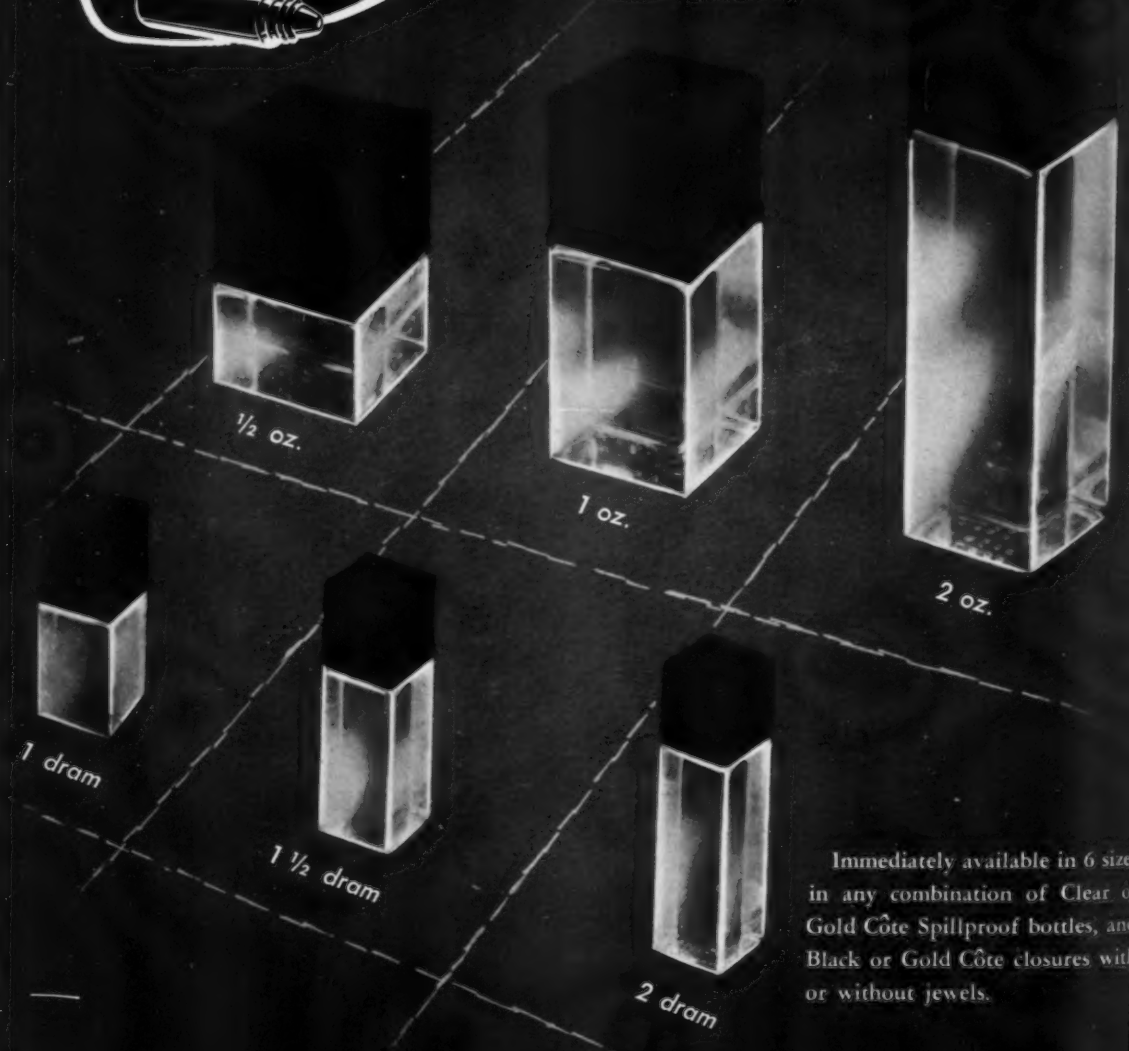
RICHFORD SPILLPROOF PERFUME FLACONS

. . . . . have done their part
Now let your Imagination
Run Wild with these
NEW SQUARE
SPILLPROOFS



Immediately available in 6 sizes in any combination of Clear or Gold Côte Spillproof bottles, and Black or Gold Côte closures with or without jewels.

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Write today for samples and prices.

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Now is the time to evaluate your product for "push-button" dispensing. Aerosols are booming. New applications for appealing, self-spraying packages are being discovered every day. If you are presently marketing your product in liquid form, the chances are you can also package it as spray or foam. Your product deserves analysis now, so we suggest you arrange with us for a free, comprehensive laboratory report. On the physical side, Continental's complete production, laboratory, and warehousing facilities eliminate any capital expenditure on your part. We do not merchandise packaged items of our own. Our sole operation is filling containers with your products . . . liquid, pressurized, or aerosol. Write today.

PRODUCTION. Continental operates 2 modern plants. Facilities will handle oil and water-base products, and refrigeration, pressure or liquid filling in any quantity. You expand sales . . . but invest nothing.

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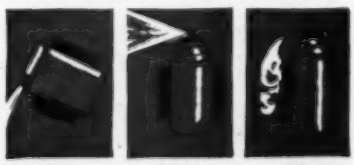
WAREHOUSING. Ample bulk storage space enables us to keep a good supply of your ingredients available at all times. Drop shipping in bulk lots. Use our Midwest plants as central distributing points.

Aerosol packaging may mean a bigger market for you. Aerosols adapt to perfumes, deodorants, medicines, insecticides, household chemical specialties, etc. Get our report now!

CONTRACT AND CUSTOM FILLING



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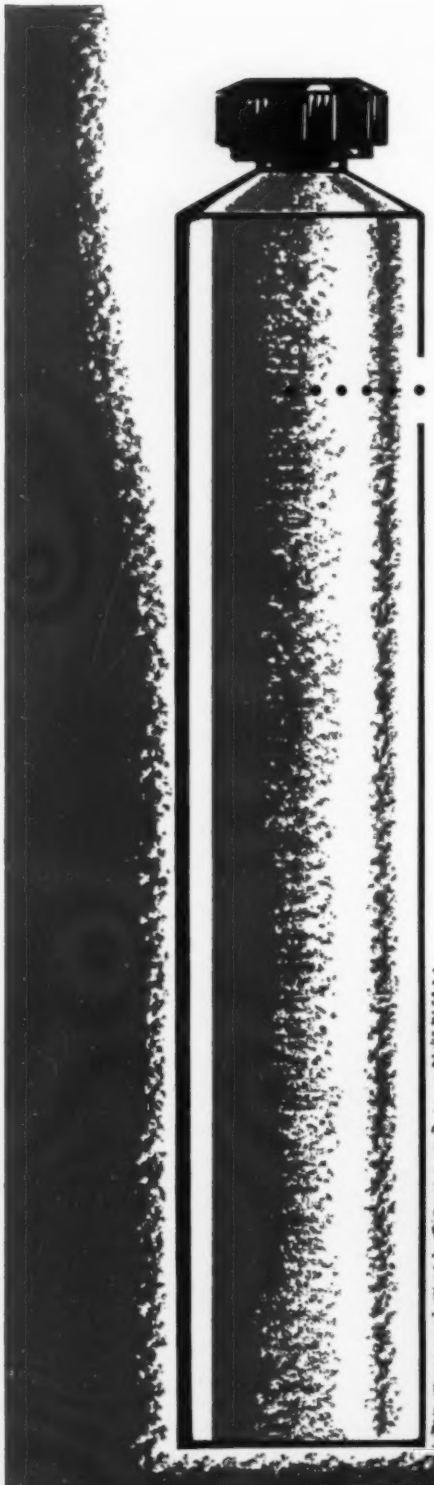

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APPLICATOR PIPES

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for creams, toothpastes,
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Faster Capping

There's a good chance your line speeds are being limited by the strength of your caps. But how to get the strength you need without buying heavier caps?

Fortunately, the secret of cap strength lies not in weight alone but also in how the plastic is distributed within the cap.

And that's why Armstrong's Hi-Tork* Caps have such outstanding strength. Each part, dome, skirt, or thread, has exactly the weight it needs for the load it has to take.

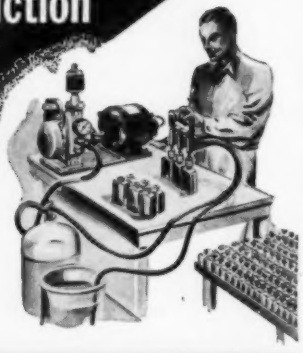
The final proof, of course, is on your own lines. We'll gladly help you get that proof in a test run. Write Armstrong Cork Company, Glass and Closure Div., 5302 Chambers St., Lancaster, Penna.

* T. M. reg. applied for

ARMSTRONG'S *"HI-TORK"* MOLDED CAPS

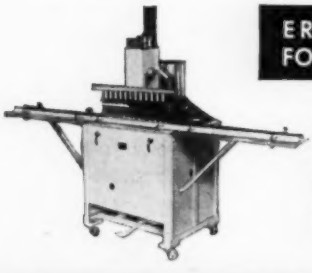
ERTEL BOTTLE FILLERS MEET DEMAND FOR 40-80 BOTTLES PER MINUTE, and

Materially lower Your Production Filling Costs



ERTEL PORTABLE FILLER

This Vacuum Bottle Filler belongs in every plant. Fills batch or sample lots of materials at lowest cost; for small operations where large expensive equipment is not practical. Fully automatic overflow—no drip spouts. Instantaneous flow — won't fill defective or cracked bottle.

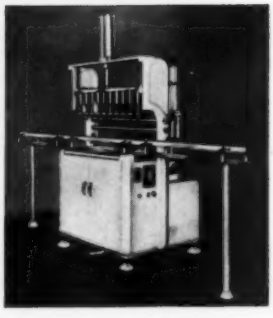


ERTEL ESA FILLER FOR SMALL BOTTLES

The most practical filler for small bottles in quantities of 40 to 60 per minute. To appreciate this unit it should be viewed in operation — the finest low cost trouble-free unit on the market.

ERTEL PNEUMO-VAC FILLER
Filling Range 3" to 13" High Bottle

For speeds up to 40 quarts per minute, this precision Ertel filler has no equal. New type spouts positively prevent drippage. Available with circulatory passages either bronze, plated, or stainless steel. Adjustments are simple and require but a few seconds time. If you have a filling problem see the Pneumo-Vac — it's designed for low cost operation.



Ask to have an Ertel representative show you why Ertel Fillers are so enthusiastically acclaimed by users in the pharmaceutical, drug, cosmetic, chemical and food industries.

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Branch Office & Showroom Located in New York City
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THOMAS REGISTER *Liquid Handling Equipment*

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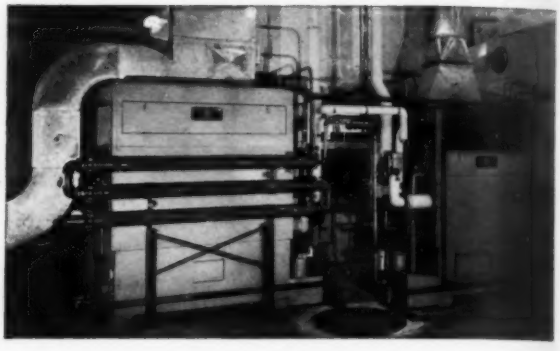
This NEW METHOD DRIES AIR

PRECISELY AS YOU WANT IT



NIAGARA CONTROLLED HUMIDITY AIR CONDITIONING

This method removes moisture from air by contact with a liquid in a small spray chamber. The liquid spray contact temperature and the absorbent concentration, factors that are easily and positively controlled, determine exactly the amount of moisture remaining in the leaving air. Heating or cooling is done as a separate function.

The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

Best and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture-sensitive instruments are required to control your conditions.

Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.

For complete information write

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Over 35 Years of Service in Industrial Air Engineering
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Garden Insects?

...you want "Black Leaf 40"

"Black Leaf" products are known far and wide for their effectiveness in combating insects in the garden . . . on the farm . . . in the home. "Black Leaf" 40 is also used as a spray in orchards . . . for killing chicken lice . . . drenching sheep . . . protecting shrubs from dogs.

The "Black Leaf" products shown here are sealed with Crown Screw Caps. These are the closures that answer every need of manufacturers who want dependable sealing . . . smooth action on production lines . . . customer convenience. If you would like to know how to have these same features in your closures . . . get in touch with your Crown Representative. Crown Cork & Seal Company, Inc., Baltimore 3, Maryland.

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Approved by millions of housewives

* "BLACK LEAF" *products are made by the Black Leaf Products Division of Virginia-Carolina Chemical Corporation, whose head offices are in Richmond, Va.*

Botticelli's Birth of Venus.

THERE'S A DIFFERENCE IN ESSENTIAL OILS, TOO!

Sometimes the difference is obvious... sometimes more subtle. You might not see it or feel it or smell it right away, but quality has a way of showing itself.

Charabot has always been out in front when it comes to quality. And this quality has not always meant high prices, either. This point is hard to get over to essential oil buyers... that it is possible to get top quality *and* value in one product.

On value alone we challenge any buyer to listen to our story on Essential Oils: the Story of Charabot, the chapters on Intégrales, Alsolutes Hyperabsolues, Floralines and the entire Charabot Family.

In the interest of better business, and at the same time maintaining (or even improving) your present standards, we recommend an inquiry from you at your convenience.

Distributors in the U. S. and Canada for CHARABOT & CIE., successors to HUGUES AINÉ, Grasse, France

CHARABOT & CO. INC.

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News . . .

Promoted by Colgate

William H. Gaines has been promoted to sales manager of the Kay Daumit division, according to R. E. Hilbrant, manager of Colgate-Palmolive Co.'s toilet article department. He succeeds Howard P. McClure who was recently named general sales manager of that department.

Samuel E. Lindley, Jr. has replaced Mr. Gaines in his former position of field sales manager for the division's eastern region. He will supervise the sales and promotion in the states east of, and including, Michigan, Indiana, Kentucky, Tennessee and Alabama.

WILLIAM H. GAINES

Parks, Shulton Sales Mgr.

Richard N. Parks, Atlantic branch manager of Shulton, Inc., has been appointed sales manager, according to George L. Schultz, president. He will assist Frank N. Carpenter, vice-president in charge of over-all sales, and he will coordinate the four domestic branch offices in New York, Chicago, Dallas and Los Angeles. His headquarters will be at Shulton's main plant in Clifton, N. J.

Pettinga Promoted by Lilly

Cornelius W. Pettinga, a member of the research staff of Eli Lilly & Co., has been named head of the firm's biochemical research department.

Assoc. Brands Addition

Associated Brands, Inc., 35 Claver Place, Brooklyn 16, has just added a modern production line for the packaging of aerosol "pressure-packed" products for such items as hair lacquers, hand creams and shaving creams.

EDWARD W. MAHONEY

Mahoney to Form Company

Edward W. Mahoney, vice-president in charge of sales at Bourjois, Inc., and Barbara Gould, Inc., has resigned, effective March 15, to establish his own sales and merchandising company. His new company will import lines and specialty items from Europe for sale to department and specialty stores, on a national basis. He will also handle a limited number of domestic lines and items for the same outlets.

Logcher on World Trip

Dr. Henri F. Logcher, export manager, Magnus, Mabee & Reynard, Inc., left February 14 for a two-month trip to Europe and Asia to instruct foreign sales representatives in new market research and expansion.

Before leaving, he addressed the MMR annual sales conference, February 10 to 13 at the Warwick Hotel, New York, on the objectives of his trip.

Loeffler Named V.P.

Alfred T. Loeffler, assistant vice-president, has been appointed vice-president, chemical divisions, of Food Machinery and Chemical Corp., according to Ernest Hart, executive vice-president. He will continue to be located at the company's New York office, 161 East 42nd St.

ALFRED T. LOEFFLER

Schumacher Heads SAACI

Warren F. Schumacher, sales manager of the fine chemical division, J. T. Baker Chemical Co., was installed as 1954 president of the Salesmen's Association, American Chemical Industry, last month at the Hotel Roosevelt, New York. Other officers also installed were John F. Henry, Adams-Henry Chemical Co., vice-president; E. L. Collins, Chilean Nitrate Sales Corp., treasurer; and Vincent L. Rebak, Grace Chemical Co., secretary.

The following men were elected to the SAACI board of directors: J. N. Conover, L. Sonneborn Sons; N. H. Fyffe, Oldbury Electro-Chemical Co.; Clifford S. Heathcote, Monsanto Chemical Co.; F. H. Johnson, Barrett division of Allied Chemical & Dye Corp.; Robert J. Roberts, Emery Industries; and M. Testa, Jr., Shell Chemical Corp.

WARREN F. SCHUMACHER

D&O Opens Organic Lab.

Dodge & Olcott, Inc. has added a fully equipped laboratory for organic research to its new laboratory facilities. It has also added a completely rebuilt analytic department. The personnel will work under the supervision of Willem Lasthuysen, one of the company's new chemical directors, who will be assisted in the organic research laboratory by Dr. Ed Schildknecht.

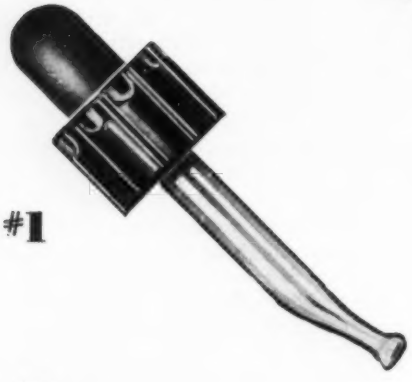
Named Gen. Mgr. by Dior

Anne Wright, executive vice-president of Christian Dior Perfumes Corp., has also been named general manager of that company. She will leave for Paris soon to confer with Mr. Dior and the French officials on future plans for the company.

Bessinger with Maschmeijer

Gerald G. Bessinger has been added to the staff of Maschmeijer, J., Inc. and will be active in the sales of aromatic specialties, essential oils and flavors.

A BETTER DROPPING PART MAKES A BETTER PRODUCT



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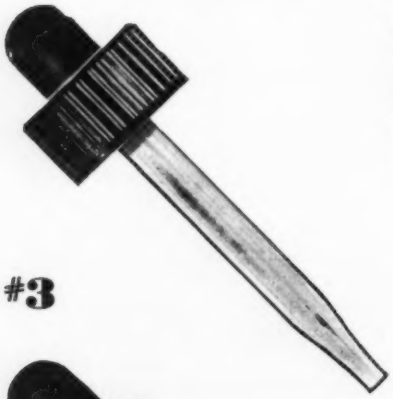

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Many a fine product has been rejected by the public simply because some seemingly small detail was below standard. The dropping part can be such a detail—an apparently simple device, yet vital to the user's satisfaction.

Since 1931, when Pennsylvania Glass originated the screw-cap dropping part, we have specialized in this important dispensing unit. This advantage in experience and specialization has made NEW PERFECTION Dropping Parts everything their name implies. Longer experience and undivided attention to one product have resulted in superior quality and reliable performance. To be sure of the best—specify NEW PERFECTION Dropping Parts.

We can supply various colors of bulbs in natural rubber or in our special oil-resisting Amekine compound, caps of plastic or metal in many sizes and colors, and various types of dropper glasses in any length with calibration in any color or plain. New Perfection dropping parts will fit your own bottles, or can be supplied in combination with our Modernistic bottles in Amber, Blue, Green or Clear glass. Sizes: 2cc, ⅛, ¼, ½, 1 and 2 oz

Write for Samples and Quotations

PENNSYLVANIA GLASS PRODUCTS CO. INC.

"Glass Goods of the Better Kind"

430 N. CRAIG ST. • PITTSBURGH (13), PA., U.S.A.

LEWIS D. WILLIAMS

DR. RICHARD H. ROBERTS

Williams, Sumner Sales Mgr.

Lewis D. Williams has been appointed sales manager for Sumner Chemical Co., succeeding Ralph L. Ericsson who was recently made executive vice-president. Mr. Williams will be in charge of all sales of Sumner's pharmaceutical chemicals.

Gottscho Awarded Injunction

Adolph Gottscho, Inc., has been awarded a permanent injunction and accounting for damages against John K. Jackson and American Marking Corp., Newark, N. J., by New Jersey Superior Court Judge G. Dixon Speakman. The court's decision, which followed a 10-week trial, prevents Jackson and American Marking from utilizing trade secrets belonging to the Gottscho company in the manufacture and sale of automatic machinery for printing codes, dates and advertising material on containers and cartons of all kinds as they come off the assembly line.

In arriving at the decision, Judge Speakman held that the Gottscho company had developed most of its secrets during 1948, the year Jackson had joined the company. The court held that Jackson, who left the employ of Gottscho in 1950 after serving as salesman, designer, assistant general manager and chief engineer, acquired his knowledge of plaintiff's secrets during his employment. A few months later he formed the American Marking Corporation in which he is principal stockholder and chief designer, to manufacture and sell machines which the court held were similar to Gottscho's.

de Laire Visits U.S.

Francois de Laire, general director of the Fabriques de Laire, arrived in New York on January 16 for a few weeks' visit. He called on his many friends of the perfume trade and the chemical industry.

Roberts Promoted by Ciba

Dr. Richard H. Roberts has been promoted by Ciba Pharmaceutical Products to the newly created position of senior clinical research associate on the West Coast. His address will be 417 Market St., San Francisco.

In his new position, Dr. Roberts will be concerned with expanding Ciba's clinical and laboratory research contacts in the West. He had formerly been associate editor of the Ciba Clinical Symposia.

Herman with Givaudan

Thomas J. Herman has joined the sales staff of Givaudan-Delawanna, Inc. and its associate companies, Givaudan Flavors and Sindar Corp., according to R. E. Horsey, vice-president in charge of sales. He will service accounts in the territory covered by the Cincinnati branch office.

Worley, A.D.M.A. Counsel

John K. Worley, a partner in Youngjohn, Worley, Brown & Flynn and predecessor firm, of Detroit, since 1945, has been elected General Counsel of the American Drug Manufacturers Association, and will succeed Leslie D. Harrop in the position on July 1, 1954, at the close of the 1954 annual meeting at Lake Placid, N. Y. Mr. Worley will also be chairman of the Legislative Section. He will retain his residence, and professional and business connections, in Michigan.

Beginning with the 1954-55 Association year, the president of the A.D.M.A. will appoint each year an Advisory Committee consisting of three members of the A.D.M.A. Legislative Section. This committee will advise the general counsel and develop programs for legislative section meetings. The senior member of the committee will preside at meetings of the section.

A.D.M.A. member firms accepted with deep regret Mr. Harrop's decision not to be available for re-election as general counsel and chairman of the legislative section.

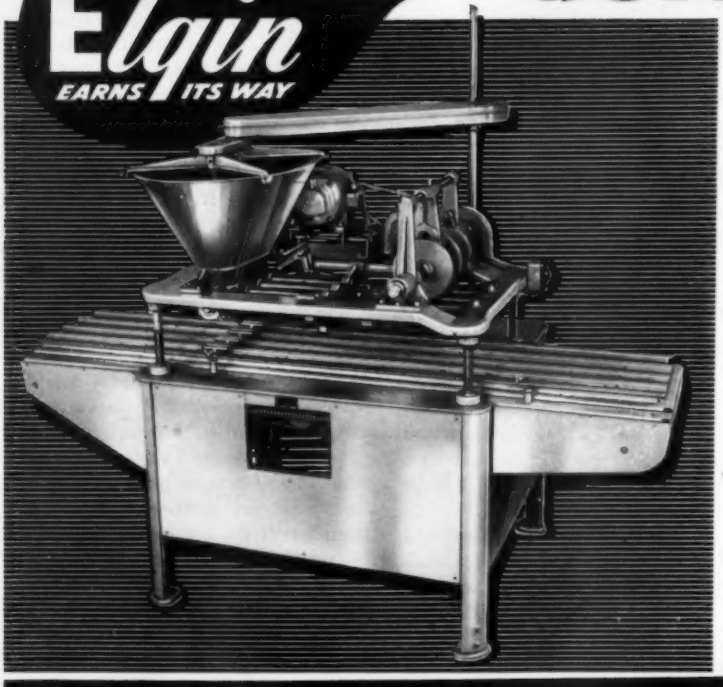
D&O Sales Representatives

John White has been added to the New Orleans branch office of Dodge & Olcott, Inc., and Frank Ball, to the Chicago office. Mr. White will service New Mexico, Texas, Oklahoma, Arkansas, Mississippi and Louisiana, while Mr. Ball will work predominantly in the metropolitan Chicago area.

Dr. Manfred L. Karnovsky, left, Harvard University Medical School, and Dr. Lewis I. Gidez, Brookhaven National Laboratory, Upton, N. Y., receiving 2nd award ($300 and honor certificates) for outstanding glycerine research, from E. W. Colt, right, chairman of research committee of Glycerine Producers' Ass'n. on January 27. Event took place at Association's 27th annual meeting in New York.

Elgin
EARNS ITS WAY

QUAD 4 VALVE FILLER



THRIFT—Economy-wise production men choose Elgin Machines for their lower initial cost, minimum maintenance and operating expense.

VERSATILITY—Widely utilized by large and small plants because of their quick, simple changeover to accommodate a broad range of products and container sizes.

DEPENDABILITY—Long years of trouble-free, continuous production distinguish the Elgin equipment now serving leading packers in the food, paint, cosmetic, oil and various other industries.

Extensively used to fill mustard, peanut butter, relish, jams, jellies, mayonnaise, soups, creams, ointments, waxes, animal foods, horseradish, roofing cement and similar products.

Write Today for New Folder Illustrating Elgin Equipment Address Dept. DA

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PRINTING THAT DEFIES WEAR

for polyethylene bottles

For printing that will not come off. Leading packagers choose Poly Perm.

- **clean, legible, flexible**
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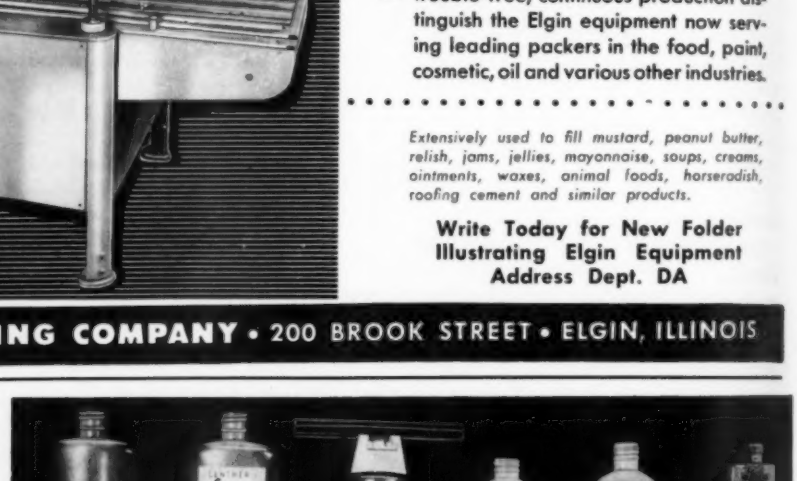

Baker Dedicates New Bldg.

J. T. Baker Chemical Co. held ceremonies on January 5 dedicating its new administration building at Phillipsburg, N. J. The modern two-story ceramic structure, the latest of 18 new buildings recently completed, was dedicated to Baker employees who served in both World Wars.

Governor Robert B. Meyner, of New Jersey, delivered the principal address.

T.G.A. Convention in May

H. Robert Miller, White Metal Mfg. Co., and Kathryn R. Colton, Morningstar-Nicol, Inc., have been named co-chairmen by the Toilet Goods Association of the convention committee for the 19th annual convention which will be held in New York on May 11, 12 and 13. The convention will be held at the Waldorf-Astoria Hotel and will be strictly confined to members of the T.G.A. and their guests in certain approved categories.

Members of the committee are: Neva Bradley, Daggett & Ramsdell; Chauncey M. Depew, van Ameringen-Haebler, Inc.; John L. Foy, Publicker Alcohol & Chemical Sales Corp; Carolyn Jackson, Hudnut Sales Co.; Frances A. Kiernan, C. H. Forsman Co.; Norman Liman, Lord Baltimore Press; Margaret Ryan, Parfums Schiaparelli; and Lee H. Simmons, Imco Container Corp.

The Toilet Goods Industry Golf Tournament will be held on Monday, May 10, at the Winged Foot Golf Club in Mamaroneck, N. Y.

Heads Warner-Hudnut

Alfred E. Driscoll, Governor of New Jersey from 1946 to January 19, 1954, was named president and a member of the board of directors of Warner-Hudnut last month. He succeeds Elmer H. Bobst, who has served as president of the company since 1946, and who will remain active in the business as chairman of the board of directors and chief executive officer. James C. Chilcott has been elected vice-chairman of the board, and Robert J. Davis, executive vice-president since 1948, will continue in that capacity.

Crogan Named Maltbie Pres.

Harold W. Crogan, formerly treasurer of Maltbie Laboratories, has been named president, replacing Dr. Russell J. Fosbinder who has held that post since 1945. Dr. Fosbinder will continue as a member of the board of directors for the present.

Dedication ceremonies on January 5 of J. T. Baker's new administration building in Phillipsburg, N. J. Governor Robert B. Meyner, left, who delivered principal address, is congratulated by Marion W. Smith, Baker president. Other notables include, left to right: Mayor Robert W. Morse, Easton, Pa.; Mayor Vernon D. Best, Phillipsburg; Clarence A. Fisher; Frank P. Inscho; Thomas C. Swick; Rt. Rev. Msgr. William J. Lannary; Rev. Everett D. Gray; and State Senator Wayne Dumont, Jr.

RUSSELL GOWANS

GEORGE CRABTREE

DONALD W. HILL

Crown Subsidiaries Merge

All of the wholly-owned domestic subsidiary corporations of Crown Cork & Seal Co. have been merged with that firm, according to John J. Nagle, president and chairman of the board. These former subsidiary corporations are now known as Crown Can division, Western division and Specialty division, respectively.

Russell Gowans, former president of Western Crown Cork & Seal Corp., has been elected a vice-president of Crown Cork & Seal Co., and will act as general manager of the Western division. George Crabtree, former vice-president in charge of manufacturing, Crown Can Co., has also been elected a vice-president of the company and will act as general manager of Crown Can division.

Donald W. Hill, former president of Crown Cork Specialty Corp., has been elected a vice-president of the company and will act as general manager of the Specialty division.

Everett B. Webster, former executive vice-president of Crown Can Co., has been appointed division administrative vice - president of the Crown Can division.

Edward B. Spread, former vice-president in charge of sales of Western Crown Cork & Seal Corp., has been appointed division vice-president of sales, Western division.

William R. Fox, former vice-president in charge of sales, Crown Cork Specialty Corp., has been appointed division vice-president of sales of the Specialty division.

Other operating personnel of the former subsidiary corporations will continue to function as in the past in each of the divisions.

FLOYD C. COSTELLO

Costello Promoted by Gair

Floyd C. Costello has been appointed assistant general production manager for container division operations of Robert Gair Co., according to William T. May, Jr., vice-president in charge of container operations. He had formerly been manager of Gair's Teterboro, N. J., container division.

Gair Buys Angelus Box

Robert Gair Co. last month acquired Angelus Paper Box Co. of Los Angeles for $3,618,000, of which $2,227,500 was paid in cash and the balance by the issue of 72,000 shares of Gair's common stock. Gair plans to operate the business as the Angelus Paper Box Company division of Robert Gair Company, Inc., according to George E. Dyke, president.

Nestle-LeMur Buys Ayer

Nestle-LeMur Co. has purchased Harriet Hubbard Ayer, famous for Luxuria, Ayeristocrat, and Ayerfast creams and cosmetics, according to Executive Vice - president I. Louis Naidech. The purchase was made by Nestle-LeMur from Lever Brothers, through G. N. Friedlander, with the change of ownership effective February 1. The purchase price was not disclosed, but the sales volume of Ayer for 1953 was reported at $3,046,943.

No change in policy is contemplated for the 57-year-old firm, but Ayer executive offices will be transferred to 902 Broadway, New York, where orders for their products will continue to be handled by their present sales organization. The manufacturing and shipping will continue at the present plant at 38-04 48th St., Long Island City.

An expansion of present advertising schedule for Harriet Hubbard Ayer is planned, including a continuation on a larger scale of newspaper advertising, campaigns in general and fashion magazines, and television.

Architect's drawing of proposed West Coast building of Bauer & Black which will be located in San Jose, Calif. The one-story plant, containing ample office and warehouse space, will cost about $250,000.

Fletcher, Field Sales Mgr.

F. Harry Fletcher has been named national field sales manager of Bristol-Myers Products division. He had previously been special assistant to Lloyd Bernegger, Bristol - Myers' executive vice-president in charge of sales.

F. HARRY FLETCHER

New Lab. for Mallinckrodt

Mallinckrodt Chemical Works formally opened a new organic research laboratory last month featuring several new ideas in floor layout and equipment design. Occupying 10,000 square feet of floor space, the new laboratory is the first completed section of Mallinckrodt's new $1-million laboratory building. Other new laboratories will be opened in accordance with the company's program to expand and modernize its research facilities.

The laboratory was designed by a committee of Mallinckrodt senior research chemists which planned the over-all layout. The group was headed by Dr. V. H. Wallingford and included Drs. C. R. Conard, E. C. Coyner, G. B. DeLaMater and G. L. Martin. This new laboratory consists of five laboratory rooms of uniform size, private offices, a conference room, instrument room, darkroom, chemicals storeroom, equipment storeroom and general utility rooms.

New Quarters for B & B

Bauer & Black plans to construct a new building on the West Coast for its office and warehouse space. The substantial increase in business in recent years, according to E. H. Brown, director of sales, has necessitated larger quarters. The new one-story plant will cost approximately $250,000 and will be constructed in San Jose on land which the company has already purchased.

Dreyer at New Address

P. R. Dreyer, Inc., has moved to new offices at 601 West 26th St., New York. The telephone number will remain WAtkins 9-1570.

Thos. Leeming Appointments

Dr. Russell A. Cain has been appointed scientific director; Gunther G. Kronheim, chemist and laboratory assistant to Dr. Cain; and John M. O'Connell, assistant to the advertising manager, according to John H. McShane, president of Thos. Leeming & Co. and Pacquin, Inc. Dr. Cain, formerly a consultant in Philadelphia, will be responsible for the scientific and technical phases of each of the companies' activities, which include analytical control, research and development. Mr. Kronheim was formerly associated with Lederle Laboratories and Mr. O'Connell, with J. Walter Thompson.

DR. RUSSELL A. CAIN

For precision and versatility—choose

OWENS-ILLINOIS for PLASTICS

for example—

Plastainer Vials
for drugs, foods and other items.

for example—

Package for inhaler.

for example—

Base for radio tube.

for example—

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for example—

Special container and metal cap for Antibiotics.

for example—

Plastic spout for liquid detergents.

Owens-Illinois packaging know-how and high-quality standards offer you the *finest* in molding plastic facilities . . . Injection molding . . . Compression molding . . . A complete range in plastics for packaging, for specialties.

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Albany ..... New York	Columbus ..... Ohio	Memphis ..... Tennessee	Pittsburgh ..... Pennsylvania
Atlanta ..... Georgia	Dallas ..... Texas	Milwaukee ..... Wisconsin	Portland ..... Oregon
Baltimore ..... Maryland	Denver ..... Colorado	Nashville ..... Tennessee	Richmond ..... Virginia
Birmingham ..... Alabama	Detroit ..... Michigan	New Orleans ..... Louisiana	Rochester ..... New York
Boston ..... Massachusetts	Fresno ..... California	New York ..... New York	St. Louis ..... Missouri
Buffalo ..... New York	Houston ..... Texas	Oakland ..... California	St. Paul ..... Minnesota
Charleston ..... West Virginia	Indianapolis ..... Indiana	Oklahoma City ..... Oklahoma	Salt Lake City ..... Utah
Charlotte ..... North Carolina	Jacksonville ..... Florida	Omaha ..... Nebraska	San Francisco ..... California
Chicago ..... Illinois	Kansas City ..... Missouri	Peoria ..... Illinois	Seattle ..... Washington
Cincinnati ..... Ohio	Los Angeles ..... California	Philadelphia ..... Pennsylvania	Toledo ..... Ohio
Cleveland ..... Ohio	Louisville ..... Kentucky		

PRECISION PLASTICS
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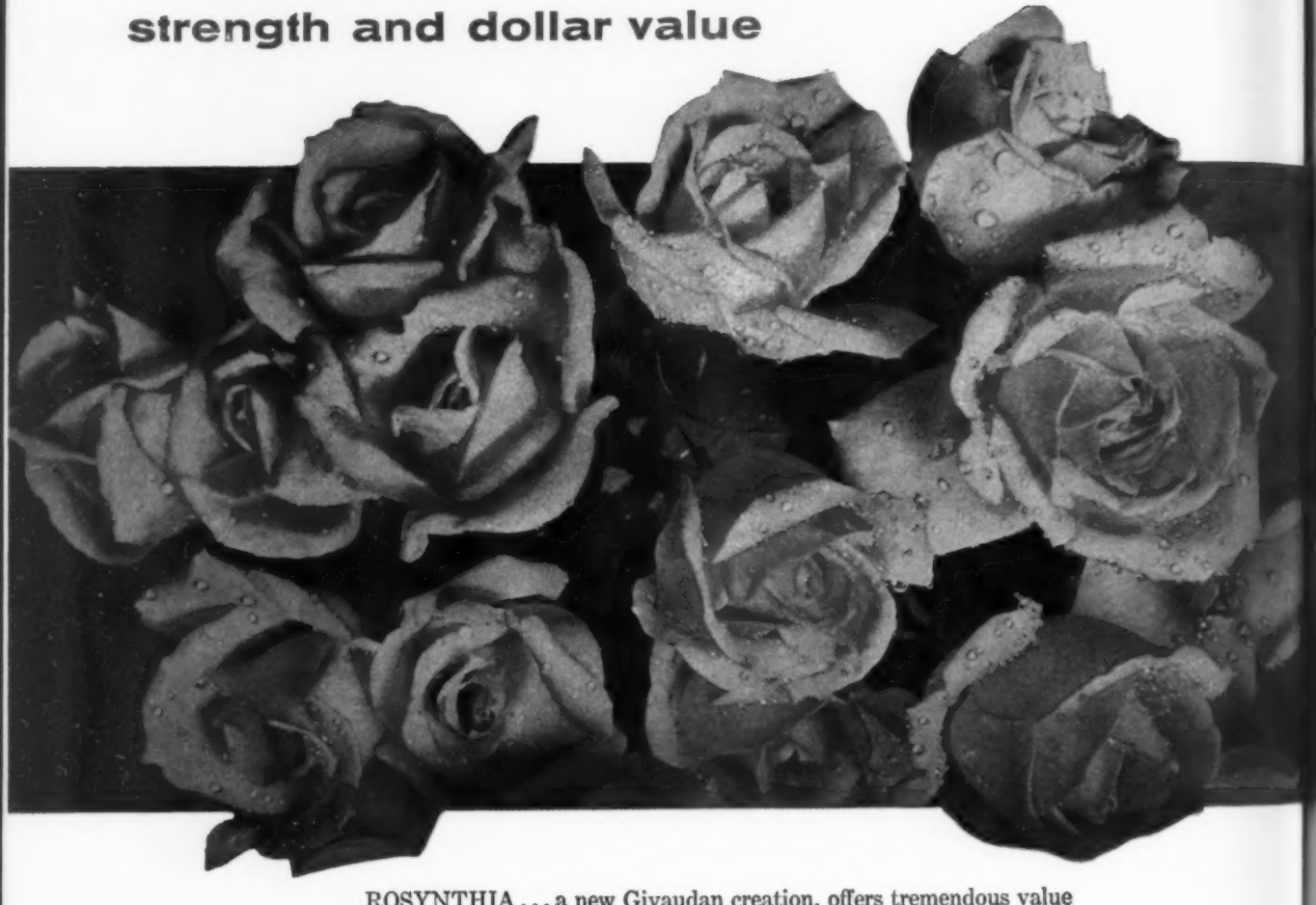
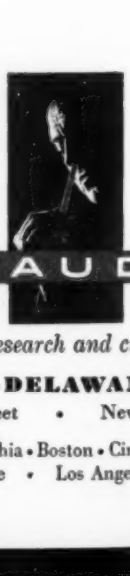
ROSYNTHIA . . . unsurpassed in lasting floweriness, strength and dollar value



ROSYNTHIA . . . a new Givaudan creation, offers tremendous value to the creative perfumer.

Developed after long study of the chemical constituents of natural rose, ROSYNTHIA has all the qualities needed in a specialty of this type . . . floral strength, odor value and lastingness. It can be used as an excellent extender or as a replacement for natural Otto of Rose and Rose de Mai Absolute, having their complementary qualities while offering a large saving in cost, plus the assurance of continued availability and uniformity.

This new development is the latest of many which have established Givaudan as a leader in the field.



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Better perfume materials through constant research and creative ability

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P. S. HOLMQUEST

Holmquest Named Mgr.

P. S. Holmquest has been named manager of the glass container department of the glass and closure division, Armstrong Cork Co., according to R. H. Hetzel, general sales manager of that division. He succeeds H. Clayton Seaman, Jr., who died December 19.

Mr. Holmquest, formerly assistant manager of the department, had been serving as acting manager during Mr. Seaman's illness.

Conn. Chemical Expansion

Connecticut Chemical Research Corp., Bridgeport, Conn., is building a factory in England in association with important British interests, according to A. O. Samuels, president. The new English plant, to be known as Midland Aerosols, Ltd., will be located in Wolverhampton, near Birmingham and will begin operations about April 1 with an initial capacity of 100,000 units daily. It will be engineered and equipped by Connecticut Chemical Research Corp. with the most modern production equipment and will be patterned after that firm.

An associated concern, also to headquarter in Wolverhampton, will produce cans for Midland Aerosols, putting that plant on a virtually self-contained basis.

Connecticut Chemical has also announced the licensing of its patented developments in push-button aerosol valves to another English firm. Specialty Valves, Ltd., which will have its plant in Birmingham, England.

The British expansion follows by a year Connecticut Chemical's establishment of a Canadian affiliate, Connecticut Chemicals of Canada, Ltd., with plant at York, Ontario, near Toronto, where all Dominion research and production is concentrated.

Robert F. Lang, formerly an executive of Metal Box Co., London, will be managing director of Midland Aerosols.

On Mallinckrodt Board

David R. Calhoun, Jr., president of the St. Louis Union Trust Co., and John M. Meyer, Jr., vice-president of J. P. Morgan Co., have been elected to the board of directors of Mallinckrodt Chemical Works. The following were re-elected to the board: Edward Mallinckrodt, Jr., chairman; Charlton MacVeagh, Joseph Fistiere, H. V. Farr, J. R. Ruhoff, V. H. Wallingford and A. H. Homeyer.

La Roche Sales Changes

William J. McLemore has been appointed divisional sales manager of the Atlantic division by Hoffman - La Roche Inc. Additional appointments include Robert H. Schmidt, as divisional sales manager of the Metropolitan West division; Edward P. Bascik, as sales training supervisor; William J. Mrazek, as divisional sales manager of the Prairie division; and John B. Munson, as divisional sales manager of the Adirondack division.

H. E. MOORHEAD, newly appointed manager of Florasynth Laboratories (Canada) Ltd.

Monsanto Appointments

M. S. McCauley has been appointed director of business research for Monsanto Chemical Company's organic chemicals division, according to Charles H. Sommer, vice-president and general manager of that division. He replaces William H. Winfield, recently appointed director of marketing research.

Gerald F. Pauley, formerly manager of pharmaceutical sales for the division, replaces Mr. McCauley as manager of sales projects. James W. Starrett, Jr., supervisor of wood preservatives and special chemicals sales, succeeds Mr. Pauley.

Lamont Promoted by McNeil

David S. Lamont, formerly eastern divisional manager, has been appointed director of the domestic sales division of McNeil Laboratories.

Northam Warren Appoints

John M. Volkhardt, formerly merchandising manager, has been appointed director of sales and merchandising of Northam Warren Corp., according to Northam Warren, president. Robert W. McPhail has become divisional sales manager in charge of the wholesale drug, and drug divisions. He had formerly been sales manager of the Pal and Personna Blade Co., Eastern division.

Griffith with Bradley Corp.

Henry E. Griffith, formerly vice-president and general manager of Plax Corp., has been appointed vice-president in charge of sales of the Bradley Container Corp., according to Bradley Dewey, president and founder. The new corporation will utilize new patented fabrication methods that have been thoroughly tested and proved in Europe and for which Bradley Container has obtained exclusive United States and Canadian rights.

Tainter Elected Trustee

Dr. Maurice L. Tainter, vice-president of Sterling Drug Inc., and director of the Sterling-Winthrop Research Institute, has been elected a trustee of Rensselaer Polytechnic Institute, according to Dr. Livingston W. Houston, president of R.P.I.

Orbis at New Address

Orbis Products Corp. has moved to a new address at 601 West 26th St., New York 1. The telephone number is WAtkins 4-7660.

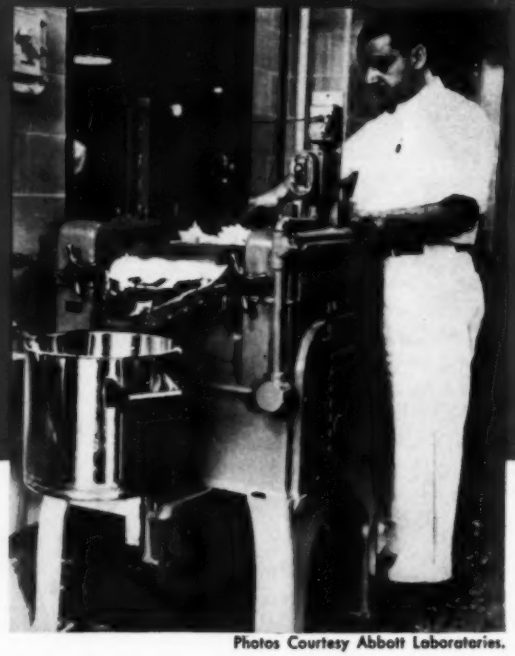
Joins Burroughs Wellcome

Dr. John C. Seed has been appointed clinical pharmacologist by the Wellcome Research Laboratories, Research division of Burroughs Wellcome & Co. (U.S.A.) Inc.

DR. JOHN C. SEED

DAY EQUIPMENT SELECTED FOR PILOT PLANT, WHERE PRECISION IS VITAL!

Efficient method for wet granulation is demonstrated in this picture of a Day Stainless Steel Kneading and Mixing Machine, used for combination powder and binder to manufacture medicinal tablets.



Photos Courtesy Abbott Laboratories.

Used here for smoothing ointments, the Day 5 X 12 Lab Three Roll Mill demonstrates its excellent application for laboratory and experimental operations of all kinds.

Pilot operations set the pattern for full-scale production. That's why heavy emphasis is placed on efficiency and precision. Abbott Laboratories demonstrates the excellence of Day equipment by choosing the two machines illustrated here for use in its pilot plant.

DAY Kneading and Mixing Machines,

No. 18 and No. 24, with capacities of 15 and 30 gallons, are ideal for experimental production. They can be equipped with DAY double-arm-sigma or fishtail agitators, depending on the material to be processed. They feature a dependable gear drive and power dump. Tanks are furnished in plain or stainless steel and may be steam-jacketed if desired.

DAY Midget Three Roll Mills

offer all the advantages and design features of larger Day models in a size adaptable for pilot operations. An extra heavy frame houses the gearing and motor, minimizing space requirements. Silent chain drive eliminates friction loss ordinarily encountered with shafting and belting. The 5" by 12" mill, as illustrated, is equipped with chamber bored rolls for water cooling or steam heating, whichever is desired.

DAY

THE J. H. DAY COMPANY • CINCINNATI 22, OHIO
INCORPORATED

RICHARD J. HALE

Hale with Polak's Frutal

Richard J. Hale, formerly sales representative of the Alcolac Corp., has joined the Chicago sales staff of Polak's Frutal Works, where he will assist A. H. Micheels, branch manager.

Flavoring Convention

The Flavoring Extract Manufacturers' Association of the United States will hold its 45th annual convention at the Hotel Biltmore, New York, from May 16 through the 19th. The annual golf tournament and outing will be held on Monday afternoon, May 17.

Members of the convention committee are: Robert Krone, Fritzsche Brothers, chairman; Chris Christensen, Chas. Pfizer & Co., entertainment; F. J. Lueders, George Lueders & Co., golf; Charles P. McCormick, Jr., McCormick & Co., program; and R. W. Symmes, Baker Extract Co., registration.

Bush Sinks Hole-in-One

Wally Bush, sales manager of Ungerer & Co., made a 135-yard hole-in-one shot at the third hole of the Essex Falls Country Club golf course on January 3. This was his first hole-in-one in 47 years of golf.

Guenther in Europe

Dr. Ernest Guenther, vice-president and technical director of Fritzsche Brothers, who recently returned from a four-month survey of Latin American essential oil production, is now in Europe. He will be there for two months, during which time he will lecture in Rome before a scientific group and later, before the Societe de Chimie Industrielle in Paris.

Falk, V.P., Baxter Labs.

Ralph Falk II, formerly assistant to the president, has been elected a vice-president of Baxter Laboratories.

Essential Oil Elections

Louis Gampert, vice-president, Felton Chemical Co., was elected president of The Essential Oil Association of U.S.A. for the new year, during its 26th annual meeting on January 8. Other officers also chosen were: P. J. Coutin, vice-president, Roure Dupont, as vice-president; F. F. Dittrich, secretary, Ungerer & Co., secretary-treasurer.

New members elected to the executive committee were R. A. Engel, vice-president, Trubek Laboratories; George H. McGlynn, vice-president, Magnus, Mabee & Reynard; H. P. Weseman, vice-president, Fritzsche Brothers; and Waldo Reis, vice-president, van Ameringen-Haebler. Ray C. Schlotterer was re-elected managing director.

Cohoes Named Sales Manager

Norman C. Cohoes has been appointed sales manager of Lanolin Plus. He first became associated with the company in 1948 as a sales representative in New Eagland.

NORMAN C. COHOES

Walker, Plant Manager

William H. Walker, formerly chief chemist and production manager for Lucien Lelong, has been appointed by the Continental Filling Corp. as plant manager of the Danville operation and head of the research department.

Lew Shelby, formerly personnel supervisor of Continental, has become assistant to the plant manager at Danville.

Proctor with Wampole

Alva Proctor has been appointed professional service director for Henry K. Wampole & Co. He had formerly been associated with Smith-Dorsey as a division manager.

Reahard Promoted by Lilly

Ralph M. Reahard, Jr., has been promoted from assistant manager to manager of the printing and label control department of Eli Lilly & Co. He succeeds the late Harry Weber in that post.

Murphy with Cont. Can

Stephen M. Murphy, formerly with National Can Co. for 24 years, has joined the sales management staff of Continental Can Company's Central Metal division, according to Robert S. Hatfield, general manager, North Central district.

Named Military Sales Mgr.

George C. Holloway has been appointed manager of the military sales division of Colgate-Palmolive Co. and will be in charge of Colgate sales to United States military installations both in this country and abroad. For the last seven years Mr. Holloway has handled Lustre-Cream Shampoo sales for the company's Kay Daumit division, with headquarters in Dallas.

Jeffs in MMR Advg. Post

Bernard Jeffs, formerly vice-president in charge of sales and advertising for Reed & Carnrick, and account executive for Cortez F. Enloe Inc., has been appointed director of advertising by Magnus, Mabee & Reynard.

Roblin Heads Research Div.

Dr. Richard O. Roblin, formerly director of the chemotherapy division of American Cyanamid Company's consolidated Research Laboratories, has been named assistant general manager of the company's research division.

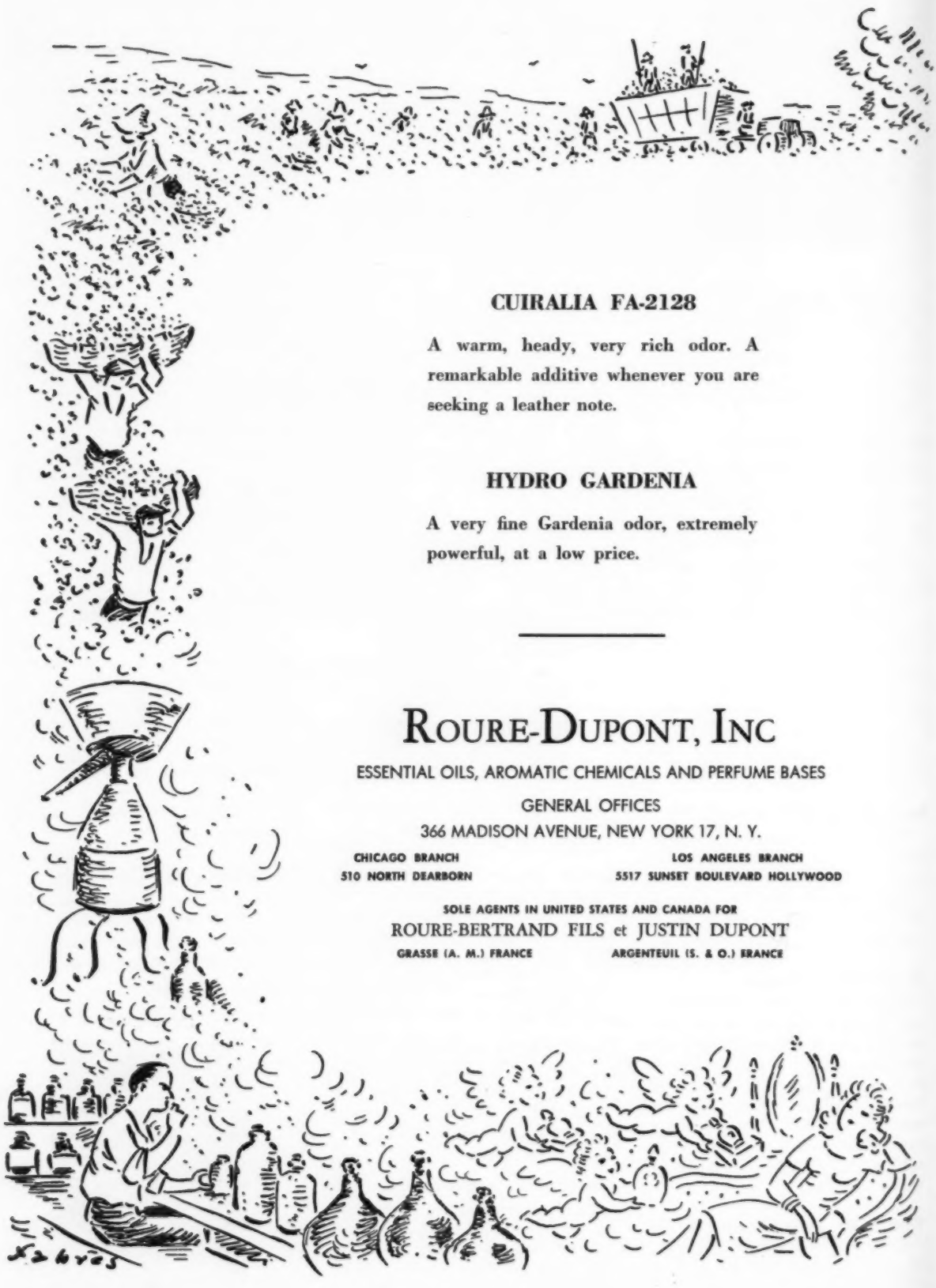
Zobel, Ass't Advg. Mgr.

Alfred F. Zobel, formerly copy chief, has been appointed assistant advertising manager by Hoffman-La Roche Inc.

Lee Promoted by Lilly

Henry M. Lee has been promoted to the post of research associate with Eli Lilly & Co. He has been a member of the Lilly pharmacology division since 1934.

HENRY M. LEE



CUIRALIA FA-2128

A warm, heady, very rich odor. A remarkable additive whenever you are seeking a leather note.

HYDRO GARDENIA

A very fine Gardenia odor, extremely powerful, at a low price.

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WILLIAM A. OWEN

HARRY G. ELLEFSON

Bristol Appointments

William A. Owen, formerly manager of sales service, has been named manager of purchases of Bristol Laboratories. Harry G. Ellefson, formerly assistant to the manager, succeeds Mr. Owen as manager of sales service.

Lakeside Labs. Transition

Lakeside Laboratories has completed a five-year transition program establishing distribution through wholesale and retail drug sources exclusively. The pharmaceutical firm is no longer selling directly to physicians.

Rejoins Becton, Dickinson

Arthur D. Ball has rejoined Becton, Dickinson & Co. as director of merchandise planning, according to F. S. Dickinson, Jr., president. He has been doing special work for the past two years at the company's subsidiary in Mexico.

Strobaeus with Lusteroid

John B. Stobaeus, Jr., has been appointed secretary and treasurer of Lusteroid Container Co., according to R. W. Davis, vice-president. He had been associated with Esso Standard Oil Company in New York for the past 20 years.

Doerr on McKesson Board

Charles D. Doerr, vice-president in charge of personnel of McKesson & Robbins, Inc., has been elected a director of the company, according to William J. Murray, Jr., chairman of the board.

Robbins Promoted by Lilly

Bueford C. Robbins has been named to the new post of manager of the finishing control departments of Eli Lilly & Co. He had formerly been head of the dry products department and chief of production administration at the Kentucky Avenue plant.

Hershner, V.P., Bio-Ramo

John Franklin Hershner has been appointed vice-president in charge of sales and new product development by Bio-Ramo Drug Co. He had been president of Peacock Sultan Co., until recently.

Dr. Berwin Abbey Cole, formerly with the Army Medical Service Graduate School, has joined Bio-Ramo as head of the company's new department of pharmaceutical research.

Smith with McKelvy

Dulany S. Smith has been appointed to the newly created position of director of new product development and market research of the Alfred D. McKelvy Co., according to Lewis F. Bonham, president. He had formerly been with Batten, Barton, Durstine, and Osborn, Inc. as drug marketing specialist in the marketing and research departments.

Mrs. William Lakritz

Mrs. William Lakritz, wife of the president of Florasynth Laboratories, died January 1 in Columbus Hospital, New York, at 50 years of age. Surviving, in addition to her husband, are two daughters, Mrs. Zena L. Graham and Mrs. Jack Friedman; one sister, Mrs. David Lakritz; and one brother, Joseph H. Fein, treasurer of Florasynth.

Leo C. Hoffman

Leo C. Hoffman, president of Whittier Laboratories and Nutrition Research Laboratories, died at his home in Chicago on December 26. He was 61 years old. At one time he had been vice-president of the Pepsodent Co. and in 1939 became associated with Nutrition Research Laboratories. In order to broaden the drug activities of this company, Whittier Laboratories was later formed.

He is survived by his wife, Mildred; a son, Vergne L., vice-president of Whittier; and five grandchildren.

William H. P. Blandy

Admiral William H. P. Blandy, president of the Health Information Foundation, died January 12 at the United States Naval Hospital, St. Albans, Queens. He was 63 years old. He was a veteran of both World Wars and commander of the joint Army-Navy task force in July, 1946, which conducted the first peace-time atomic bomb tests on Bikini Atoll in the Marshall Islands.

John G. Searle, chairman of the board, Health Information Foundation, stated, "As president of Health Information since his retirement from the Navy, Admiral Blandy assumed a heavy responsibility in the constant effort to strengthen the health defenses of the nation. He accepted this post in 1950 because he saw in it the opportunity to continue his lifetime of service to the American people. We who have worked closely with him during the last four years, as well as his comrades in arms of the past, have good reason to know of the tremendous debt of gratitude the entire country owes Admiral Blandy."

He is survived by his widow, Roberta Amies Blandy; a daughter, Mrs. Hope Blandy Lee; and a son, Lieut. William P. Blandy.

A. C. Cardinal

A. C. Cardinal, for many years traffic manager of Hoffmann-La Roche, Inc., died January 19 in Montclair, N. J., at 65 years of age. Among his survivors is a brother, Paul J. Cardinal, vice-president of the vitamin division of the company.

Howard A. Krumwiede

Howard A. Krumwiede, 62, personnel director of E. R. Squibb & Sons, died at his home in Highland Park, N. J., on January 26. He worked as a pharmacist before joining Squibb in 1919 as a chemist.

Surviving are his wife, Mrs. Elizabeth Gelhard Krumwiede; two daughters, Mrs. Walter E. Boek and Mrs. Michael Shaara; and two sisters, Mrs. Cedric Krug and Mrs. Eli Caplan.

Jacques P. Wolf

Jacques Phillip Wolf, 80, founder and president of Jacques Wolf & Co., died at his home in Montclair, N. J., on January 26. He came to the United States from France in 1901 at the age of 28.

Surviving is a cousin, Miss Martha Fischesser. Mr. Wolf never married.

Baker BROMIDES

AMMONIUM • POTASSIUM • SODIUM

»»» dissolve readily

»»» compress easily

Potassium Bromide, U.S.P., Granular—Actual Size

BAKER BROMIDES ARE AVAILABLE IN THE FOLLOWING TYPES AND CONTAINERS

AMMONIUM BROMIDE, N.F.
Granular ..... 25, 100 and 400-lb. containers

• • •

SODIUM BROMIDE, U.S.P.
Granular ..... 25, 100 and 500-lb. containers
Powder ..... 300-lb. containers

• • •

POTASSIUM BROMIDE, U.S.P.
Crystal ..... 100 and 400-lb. containers
Fine Crystal ..... 25, 100 and 400-lb. containers
Granular ..... 25, 100 and 450-lb. containers
Powder ..... 400-lb. containers

All containers are Polyethylene-lined.

»»» Pharmaceutical and photographic manufacturers need the exceptional purity found in Baker Bromides to gain greater uniformity in their finished product.

All three Baker Bromides — Ammonium, Potassium and Sodium — dissolve readily, and produce unusually clear solutions. The granular forms of all three are easily compressed into tablets without further granulation.

Think of how these features of Baker Bromides can save you time and money — help you gain more economical and trouble-free production.

And you have real security because of Baker's ability to manufacture to exacting standards of purity and uniformity.

For those interested in the various particle sizes of available Bromides, the chart at left will be helpful. All Baker Bromides listed fully meet U.S.P. or N.F. standards.

For additional information, write J. T. Baker Chemical Co., Phillipsburg, New Jersey.

Baker CHEMICAL

Baker Chemicals

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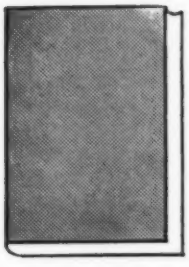
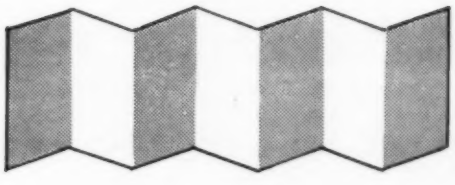


Trade Literature



Wirebound Crates and Boxes

A revised edition of What to Expect from Wirebounds, has just been issued by the Wirebound Box Manufacturing Association, 327 S. LaSalle St., Chicago 4, Ill. The new edition is profusely illustrated with actual "case history" pictures of wirebound boxes, crates, and pallet boxes in use.

Laboratory Glassware

Corning Glass Works, Corning, N. Y., has issued a 200-page catalog of laboratory glass ware.

The New Jersey Zinc Story

The New Jersey Zinc Company, 160 Front St., New York, has issued a 52-page booklet entitled The New Jersey Zinc Story, which is a reprint of an article which appeared in Mining Engineering.

Protoveratrines

S. B. Penick & Company, 50 Church St., New York, has issued a brochure covering recent developments in the chemistry and hypotensive action of the highly purified Protoveratrines A & B. The title is Protoveratrines A & B in the Treatment of High Blood Pressure and Toxemia of Pregnancy. Special note is made of the newly developed chemical assay using the Craig countercurrent method.

Brochure on Folic Acid

New York Quinine & Chemical Works, 50 Church St., New York, has issued a brochure on folic acid, including a description of the microbiological method of assay for folic acid.

Adenylic Acid Bulletin

Schwarz Laboratories, 230 Washington St., New York, has issued a technical bulletin on adenylic acid (yeast adenylic acid).

The Lederle Story

Lederle Laboratories Division, Pearl River, N. Y., American Cyanamid Company has issued a 32-page booklet called The Lederle Story. The booklet is profusely illustrated.

Ceramics and Man

Ceramics and Man Through the Ages is the title of a beautiful 32-page booklet issued by the Aluminum Company of America, 1501 Alcoa Building, Pittsburgh 19, Pa. Among the museum pieces shown in full color are ancient Babylonian bricks, Egyptian glazed wire, Mayan orange ware, Ming porcelain, Venetian glass, and Wedgwood Jasper ware.

Methyl Amyl Acetate Bulletin

Methyl amyl acetate is fully described in a new technical bulletin just released by Carbide and Carbon Chemicals Company, 30 East 42 St., New York 17. In the pharmaceutical industry this chemical is used for concentration and purification of antibiotics. For example, it is an extractant in the purification of penicillin.

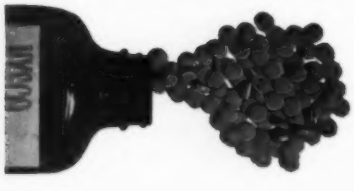
Booklet on Myristyl Alcohol

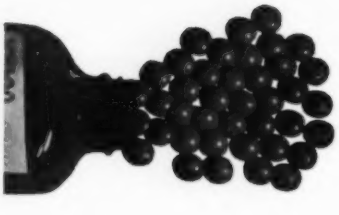
A new technical bulletin on the uses and specifications of myristyl alcohol (a normal C_{14} alcohol) is available from Aceto Chemical Co., Flushing, N. Y.

The Aerosol Market

Kinetic Chemicals Division, E. I. du Pont de Nemours & Company, Wilmington 98, Delaware, has issued a 32-page booklet entitled, The Aerosol Market. This is described as a report of the 1953 consumer survey—a study of consumer knowledge, use and opinion of aerosol-packaged products.

One Press... Four Days... 6,000,000 Tablets





Nysco Laboratories, Inc., Long Island City, N. Y., was recently faced with an emergency order for 6,000,000 ferrous sulfate tablets. Only one of its eight Stokes Model BB-2 tabletting presses could be spared for the job . . . yet the press produced the prescribed quantity in just four days . . . without interrupting regular production schedules.

Usual output at Nysco Laboratories, Inc. is around 20,000,000 standard preparation tablets per week, produced from a stock of over 170 sets of Stokes punches and dies. Over 3,000 different preparations are made by this private formula manufacturer for the Armed Services, hospitals, wholesalers and exporters.

Stokes has the right machines and proved techniques for practical and profitable tabletting manufacture. Easily adjusted or adapted for different tablet sizes, shapes, pressures and speeds, Stokes tabletting presses can be operated at low cost, high output, and maximum efficiency.

Pharmaceutical manufacturers may consult with the Stokes Advisory Service and Stokes field engineers, without obligation, on such problems as tablet formulae, punch and die design, and improved manufacturing and operating procedures.

Send for Catalog No. 800 "Stokes Tabletting Presses", which pictures and describes tabletting processes, and for Catalog No. 600, "Stokes Pharmaceutical Equipment", which describes the complete line of Stokes pharmaceutical machinery now available.

F. J. Stokes Machine Company
Philadelphia 20, Pa.

STOKES

STOKES MAKES: High Vacuum Equipment, Vacuum Pumps and Gages/Industrial Tabletting, Powder Metal and Plastics Molding Presses/Pharmaceutical Equipment

Management Forum

by Francis Chilson
INDUSTRIAL CONSULTANT

Free Enterprise

After reading my article last month on private companies, one of my good friends in the industry, who inherited a substantial business from his father, vehemently took me to task about my "radical" views on the subject. In fact, he called me a communist. He said I was promulgating a "share-the-wealth" plan. I expected this. It is fashionable nowadays to call everyone who disagrees with you a communist. My friend didn't think; he simply got mad. When he cools down and re-reads the article he will discover that it suggests a means by which the integrity and virility of the free enterprise system can be preserved, and it also suggests a method by which greater economic democracy can be achieved.

Everyone who has ever grown an apple tree knows that it is necessary every year to go over it thoroughly and prune out all rotten, defective and unnecessary branches, in order that the tree may continue to flourish and bear sound fruit. Likewise must the free enterprise system be pruned of all its rotten branches to keep the core of the system sound and flourishing.

To this end was the Securities Exchange Commission established. For the first time since the beginning of the corporate system the S.E.C. provided a means by which the free enterprise tree could be pruned of its rotten branches. To my mind the S.E.C. was the soundest piece of economic legislation ever passed. It accomplished what the Clayton Act had failed to accomplish. When you read the history of corporate finance prior to the establishment of the S.E.C., you cannot help being amazed at the dishonest practices that were permitted in the name of free enterprise. A corporation could float an issue of stock without any real asset value behind it, and could make the most wildly exaggerated claims for the real and potential value of the stock they were issuing. It was a common practice to merge two or three companies and then float an issue of stock many times the combined value of the companies involved. All such practices are now illegal and you can buy stock at prices representing its real value. But the S.E.C., like all other human institutions, can in time be emasculated by one means or another, so that it, too, will have to be overhauled from time to time.

In recognition of the need for economic democracy, which can be achieved through universal stock ownership, the Stock Exchange is working out a plan so that every man can, to the extent of his ability to save, participate in the ownership of our economy. And to the extent that he participates he also can have a voice in the management of the economy. That's economic democracy.

Since privately owned corporations receive as many benefits from the public as corporations whose stock is listed on the exchanges, it seems logical to suggest that they should be made amenable to the same restrictions. Every corporation, public or private, is a trusteeship, and the first duty of the trustees directing the corporation is to maintain its virility as a free and growing enterprise. It should not be possible for owners of a private corporation to regard the company as a personal chattel which they can cultivate or neglect, as they choose.

If privately owned corporations were compelled, after reaching a certain size, to sell a substantial proportion of their stock to their employees or to the public, no limitation would be in fact placed upon their growth. On the contrary, the growth of such enterprises would undoubtedly be accelerated through the infusion of new brains into their management. Moreover, the founder of an enterprise which had reached its maximum size under private ownership would not be prevented from starting another enterprise if he still had the energy and brains to do it. As a matter of fact, some of them do exactly this, and would continue to do so regardless of restrictions. I know of several such instances in this industry, and one in particular, wherein a young man inherited a business from his father,

COLTON
COLTON

which he has succeeded in increasing several times, and during the same period he has established two other different enterprises. Both of these other enterprises are successful, and one indeed is growing like the proverbial "green bay tree." If there had been a legal restriction on the size of the corporation he inherited, he would have started the new enterprises anyway. It is men like this who keep our economy vigorous, and no restriction must ever be placed upon the right of a man to start as many enterprises as he wishes. That's "free" enterprise.

Professional Management

During the past fifteen years we have witnessed a tremendous increase in professional management. And I believe the day is not far off when stockholders will insist that the enterprises in which they have invested be directed by professionals. Management has always been regarded as an art. If a man was at the head of a successful enterprise, he was regarded, *ipso facto*, as a good manager. No credit was given to the factor of time or to the growth of the economy. There are many outstanding examples of this in the histories of many successful firms that happened to be in business at the beginning of the war, which suddenly thrust an overwhelming demand for their goods and services upon them. In 1937 a friend of mine bought a controlling interest in a small outfit that made a gadget for airplane motors. His reason for doing it was that the little outfit, comprising a total of nine men, happened to be located in his home town. Moreover, as he told me at the time, he liked mechanical gadgets and he felt that some day there would be a demand for the particular gadget the little shop was making. By the end of the war the company had mushroomed into a thriving organization employing 500 men, and it is still a very thriving concern today. It wasn't foresight or wise management that caused this organization to grow so rapidly; it happened to have the right gadget at the right time.

But in the normal course of events the successful operation of a business cannot depend on good luck or any kind of opportunism. It must depend upon farsighted direction and daily attention to minutiae to keep the organization headed in the right direction.

Apologia

I should like to apologize to the English in general, and to my English friends in particular, for lambasting their cooking. I said it was lousy. I now swallow that statement and will admit that their cooking is almost as bad as ours. If you want to find out how really bad our cooking is you have only to take a long automobile trip and eat in some of our roadside restaurants as I did recently. What indigestible garbage is foisted upon the American people in the name of food! Most of us who can afford to go to England, for business or for pleasure, also can afford to eat in the better restaurants at home. Usually we have a few pet restaurants in the bigger cities, and when we get out into the hinterland we stay at the best hotels or are entertained by friends. We seldom are forced to eat in cheap restaurants that are dominated by the smell of rancid grease. When we go to England and eat in the average restaurant or hotel we yell like bloody murder because the food isn't up to the standard of "21." If you really want to find out how bad food can be, try Southern cooking in the average Southern restaurant. Southern cooking is wonderful to read about, but don't try any of it unless you can get it in a Southern home or in the few exceptional Southern restaurants that are scattered around the South at long intervals. Southern restaurants are not operated by the descendants of Robert E. Lee. They all look like Greeks to me and the smell of "Greece" pervades the atmosphere of their establishments. Therefore I bow in humble contrition to the English for what I said about their culinary abilities. As a matter of fact, I got a lot of excellent food in England, but only when I was with Sir John Walmsley who is a gourmet and a lot else besides. He can spot a well turned bit of calf or a nicely rounded leg of chicken a half a mile away.

As the English See Us

The following article was pinched from punch:

"In most New York apartments you will observe that part of a window has been taken out and a machine with two knobs (resembling an attenuated radio) has been inserted. You are breathing by courtesy of this very air-conditioner which both brings air in to the central-heated atmosphere and keeps noise out.

"A typical New Yorker will live in his apartment for an entire winter without once opening a window, his auditory contact with the outside world of sirens, bells and hooters thus soothingly muffled. Evenings he returns from the office, his telephone ear ringing, his buzzer finger aching, his head splitting, dying for a drink. The sterile air in the apartment sizzles. The air-conditioner hums soothingly like some invisible equatorial bird, and the refrigerator is full of ice. As he sips his bourbon on the rocks, the New Yorker relaxes, waiting like a throbbing engine for the telephone to ring.

"Heat comes before air-conditioning—crawling, relentless, piped steam heat, curling beneath the streets, climbing story after story, rattling the iron pipes in all the skyscrapers, pressing onwards, upwards, to this room here, this one with the fashionably dark-toned walls, and the white-painted furniture, and the blessed air-conditioner humming tirelessly. The steam heat saturates the air so that, heavy and motionless, it crouches on the skin like a vast amorphous toad, drawing sweat till the New Yorker pants for the tinkling ice rocks of another bourbon and water.

"The heat, piped along the streets, brings protection from snow and ice, the sudden fury of the blizzard, with its bitter violent wind stripping the striped awnings, freezing everything except the red-hot pipes. Energy and capital have constructed this protective barrier

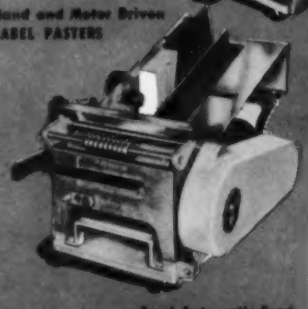
it takes a PRO

TO SOLVE A LABELING PROBLEM!

POTDEVIN LABELING MACHINES

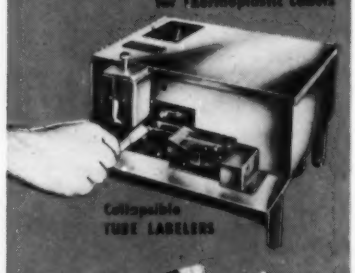
used in more drug and cosmetic plants than any other make

Hand and Motor Driven LABEL PASTERS

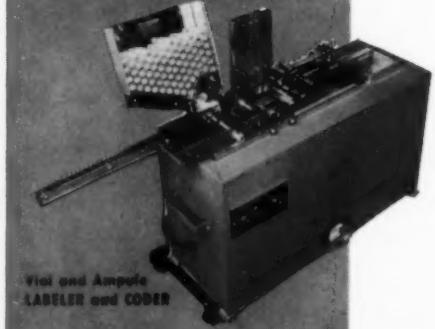


Semi-Automatic Feed LABEL PASTERS

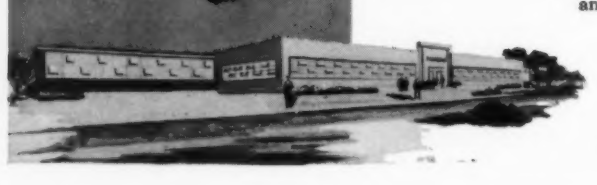
LABEL ACTIVATORS for Thermoplastic Labels



Collapsible TUBE LABELERS



Vial and Ampule LABELER and CODER



Ideally suited for short-run production or for auxiliary use so as not to disturb a mass production set-up. Write for literature and details on **FREE TRIAL OFFER.**

Hand and Motor Driven LABEL PASTERS
Highly versatile, handles any shape label without adjustment. Dial control regulates paste flow, eliminating excess. Cuts stock loss. One machine can supply several operators. Available in 6"-8½" models.

Semi-Automatic Feed LABEL PASTERS
Quickly adjustable to all shapes of labels, from ½" to 7½" wide. Dial regulates paste flow. Speeds production up to 50%. Suitable as auxiliary unit in mass production operation. Leaves mass production equipment undisturbed.

LABEL ACTIVATORS for Thermoplastic Labels
Activates delayed tack, pre-coated labels quickly and evenly. Permanent labeling on glass, metals, plastics, fabrics, etc. No water or glue to smear product. Thermostatic heating control. Small and portable. Available for 6" and 12" widths. Motor driven.

Collapsible TUBE LABELERS
Applies 32 slip labels per minute to collapsible tubes. Automatically forms and ejects label on tube. Machines for ⅛, ¼, ½, 1 oz. tubes.

VIAL and Ampule LABELER and CODER
Thermoplastic labelers in 1, 2, 3, 5 and 10 c.c. sizes. Hopper automatically feeds vial or ampule for labeling and coding.

CUT CLEAN-UP TIME BY 50%

NEW POTDEVIN RELEASE-COTE

prevents coating materials from adhering to the walls of pots, tanks, rollers, shafts, feed tables and other exposed surfaces.

GENEROUS AMOUNT OF RELEASE-COTE SUPPLIED WITH ALL POTDEVIN COATING MACHINES.

POTDEVIN RELEASE-COTE available in quart, gallon and 5 gallon containers.

POTDEVIN MACHINE CO.

257 North Street Teterboro, N. J.

Specializing in Labeling Machines for over 60 years

against the cold war of winter. At night, as the air begins to freeze, vents in the New York streets breathe out heavily like grids over imminent hell. The empty roads steam as clammy life pipes through to a million airless rooms.

"Certainly the heat has disadvantages. It is hard to control; on the coldest night it may be necessary to strip your shirt off in the apartment. The seams in the floor open. Furniture cracks and comes apart (antique furniture falls to pieces), but the cold is defeated, though not the common cold. That flourishes in the saturated atmosphere, and new "bugs" are discovered by disconsolate cliff-dwellers who cannot believe that they, who have conquered the greater enemy absolutely, have been defeated by the simple cold. As the long New York day sniffs to its winter end it leaves behind a trail of handkerchief tissues as long as the city's protective pipe line.

"Yet all this is a most encouraging example of consumer goods consumed; for, observe, the steam heat which increases the New Yorker's liability to colds in the head, confines him to his steam-heated apartment, where he watches in the even warmth (which is the best cure for colds) a television programme coming to him by courtesy of the manufacturers of the handkerchief tissues, without which (unfortunately) no New York girl's handbag is quite complete."

NB: What about us pill makers.

Herringbone Palletizing

In order to cut down the amount of aisle space wasted in palletized areas I have, in a couple of instances lately, arranged the pallets in herringbone fashion. The one immediate benefit of such an arrangement is that it permits much faster lift truck manipulation since the trucks need only to make a 45 degree turn to pick up a pallet or drop one. The herringbone arrangement is particularly good in areas where orders are assembled directly from pallets. By proper arrangement, and the maintenance of one-way traffic, order pickers can pick from both sides of the aisle which never needs be more than six or seven feet wide. In warehouse areas where pallets are stacked two or three high, you don't save much space by arranging the stacks of pallets in herringbone fashion, unless the stacks are several pallets deep. Then you do save space because the width of the main access aisles is reduced. After all, you cannot reduce the area occupied by a pallet of a given size, but you can reduce the width of your main aisles and you can speed up the operation of your trucks.

A Plug

I should like to say a kind word for my good friend V. P. Victor, Consulting Engineer, of 15 Beekman Street, New York City. Vic is one of the best mechanical engineers I ever worked with and he is an authority on drying in all its forms, air-conditioning, heating, ventilation, and dust removal. The next time you have a problem in any of these fields, be sure to call him in. His fee will not be an expense because it will represent only a very small part of what he can save you in installation and operating charges. He is a good egg.

Thought for Today

Always pay your debts ahead of time. This will amaze your creditors; astound your friends and confound your enemies.

The following information is supplied by manufacturers of the equipment described and claims made below by these manufacturers are passed along for what they are worth. Presentation of such notice in this department is not to be taken as endorsement of the claims or of the equipment.

Trays and Tote Boxes

New trays for materials-handling save labor, time and space while reducing contamination and distortion of contents and serving longer than the fiber boxes or coated metal pans they replace. The trays are molded of Bakelite polyester resins and Fiberglas for use in chemical, pharmaceutical, baking and other food handling industries.

Lightweight and stronger than steel on a strength-weight basis, these trays are easy to handle. The combination of Bakelite polyester resins and Fiberglas produces trays with a flexural strength of 30,000 pounds per square inch. They have an impact resistance of more than 15 foot-pounds. The smooth working surface withstands daily loading, unloading, scrubbing, dehydrating, freezing and rough handling with little sign of wear.

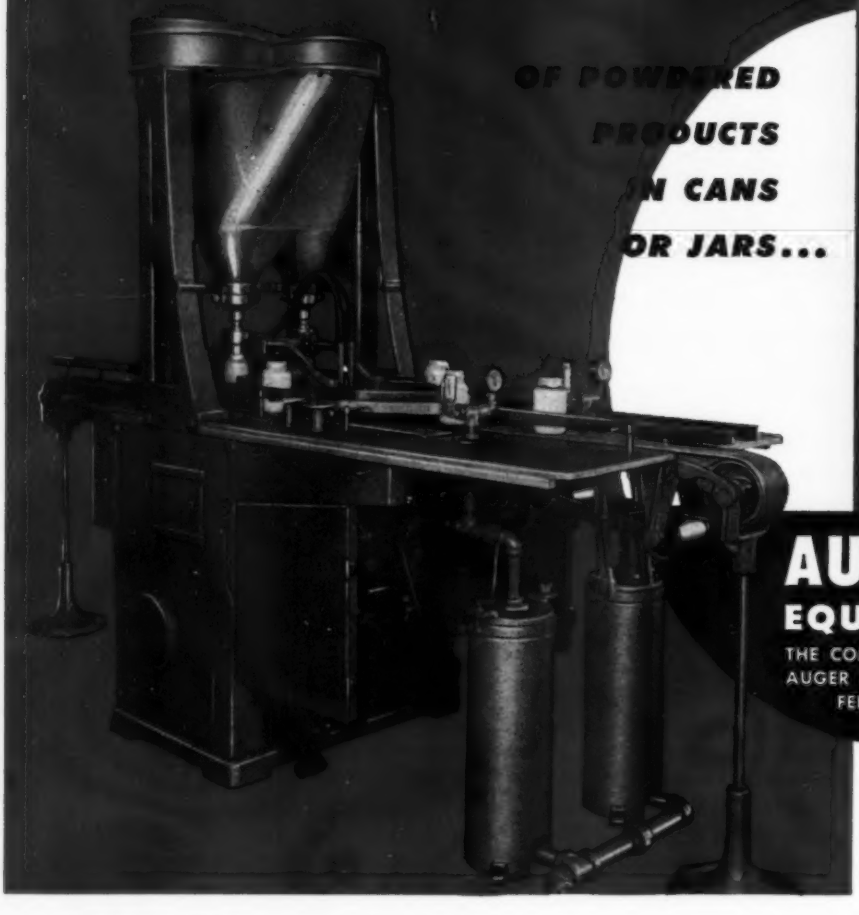
The trays are stable over a temperature range from minus 60 to plus 300 deg. F., and they will not dent, warp or rot. Resistance of Bakelite polyester resins to acids, dilute alkalies and most other chemicals prevents harmful reactions between tray and contents. The trays can be scrubbed vigorously and repeatedly to prevent contamination of contents. Rust, to which foods or chemicals are often exposed when the coating of a metal pan becomes damaged, is eliminated because the tray has no metal parts.

Developed by Molded Fiberglas Tray Company, Linesville, Pa., the bread-handling trays molded of Fiberglas impregnated with Bakelite polyester resin are now used by five large baking companies—Continental, Purity, Ward, Liberty, and Koester. Other models have been adopted by companies such as Allied Chemical & Dye Corporation's National Aniline Division and R. P. Scherer Corporation, producer of about 95 per cent of all soft gelatine capsules for pharmaceuticals and drugs.

In a large bakery, the wrapping machine feeds 10 or more loaves of bread onto one of these trays in a single horizontal layer. This arrangement prevents

For Tight, Clean, Fast Packaging

OF POWDERED
PRODUCTS
IN CANS
OR JARS...



AUGER-VAC EQUIPMENT

THE COMBINATION OF AUGER AND VACUUM FEED

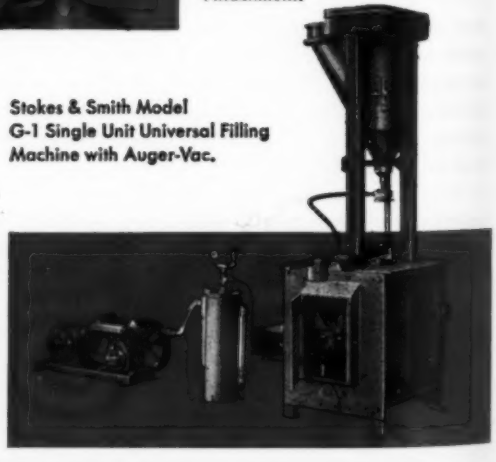
Stokes & Smith Model HG-84 Automatic Duplex Filling Machine with Auger-Vac. Attachment.

● For fast, dustless auger feed filling of hard-to-pack products such as coffee, non-fat milk powder, cocoa, flour and dehydrated foods, select S & S Auger-Vac equipment.

Operation is simple: A vacuum is first drawn on the container by a motor driven vacuum pump. The auger head then accurately tight packs the desired amount of product. Containers may be cans or jars of any air tight material.

S & S Auger-Vac equipment may be used with the STOKES & SMITH Single Unit Universal Filling Machine, or with the automatic fillers for higher production. Speeds up to 100 per minute.

Stokes & Smith Model G-1 Single Unit Universal Filling Machine with Auger-Vac.



STOKES & SMITH CO.

4912 SUMMERDALE AVE., PHILADELPHIA 24, PA.

Pacific Coast: SIMPLEX PACKAGING MACHINERY, INC., 534 - 23rd AVE., OAKLAND 6, CALIF.

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SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

TRADE MARK

distortion of warm bread by its own weight which often occurs when it is stacked on end in fiber boxes. A gravity conveyor or standard cooling racks carry the trays to the loading dock, eliminating heavy, costly conveyor racks. In a case study of their conveyor equipment used with these lightweight trays, it is reported by the Rapids-Standard Co. that one man can load all the trucks formerly loaded by six—thus saving 40 man-hours daily.

The bread is handled only once—from tray to store counter—and remains uncrumpled and undistorted. Empty trays nestle closely and lock together in high stacks that take much less space than fiber boxes in truck and bakery. Durability of Fiberglas impregnated with Bakelite polyester resin gives the trays long service life, reducing replacement costs.

National Aniline estimates that trays molded of Fiberglas impregnated with Bakelite polyester resins will cut replacement costs 25 to 30 per cent. They are used for dehydrating chemicals in place of enameled drying pans which dent with rough handling thus damaging the coating and exposing the contents to metal or rust.

Additional advantages are provided in trays of a new design molded for R. P. Scherer Corporation. Corner lugs lock a stack of trays together so they can be held at a 45 degree angle without toppling. Opposite sides of each tray are open to permit free flow of air over the soft gelatin capsules. The trays molded of Fiberglas impregnated with Bakelite polyester resin are stacked and moved through the drying tunnel without the heavy racks needed for coated metal pans.

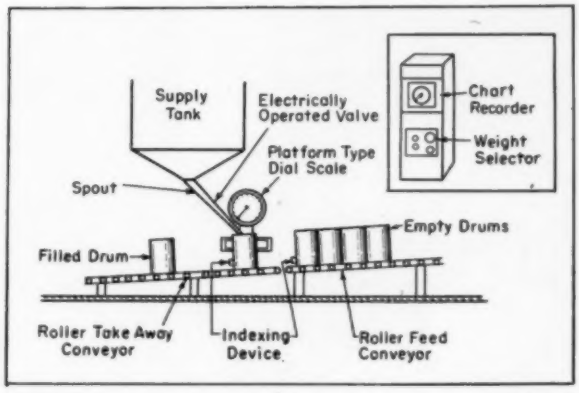
New Automatic Weighing System

Richardson Scale Co., Van Houten Ave., Clifton, N. J. has developed a new and unique automatic tare-weighing system that does away with even the smallest overages and underages. Based on an advanced-type of instrumentation, the system also permits finer process control than has been heretofore possible in weighing and filling operations.

In this system, a drum, can, cylinder or box is automatically tared and then filled with product until a selected weight is reached. The precise weight of product in the container is then recorded or printed for permanent record.

The system is particularly suited for handling petroleum, dairy, food, or chemical products—any liquid or solid product in any operation where good quality control is desirable, where savings of a few ounces or pounds mount to considerable sums over a month's or year's time.

Containers may be fed to the weighing platform manually or by an automatic indexing system. Automatic controls govern all phases of the weighing process. Taring is accomplished instantaneously by instruments fitted to the scale. Unlike hand taring systems, this system is fast, consistent, and eliminates any possibility of human error.



The automatic scale used in this system has an accuracy of less than 0.1 per cent. Product is weighed in the shipping container and not in a weigh hopper, where liquids in particular could cling to the walls. In effect, the container here serves as a weigh hopper.

Over-under control may be applied, if required. With this control, the process would automatically shut down when an overage or underage occurred. In any event, a permanent record of the weighings is given to the customer to assure him that he is getting no underage.

Up to Date Instrumentation—Unlike other automatic taring systems, this system does not employ magnetic mercury switches or photoelectric cells. And it does not move a poise on a beam scale to tare the weight.

Unlike other tare-weighing processes, this process furnishes complete instrumentation. That is, the system indicates, controls, prints or records.

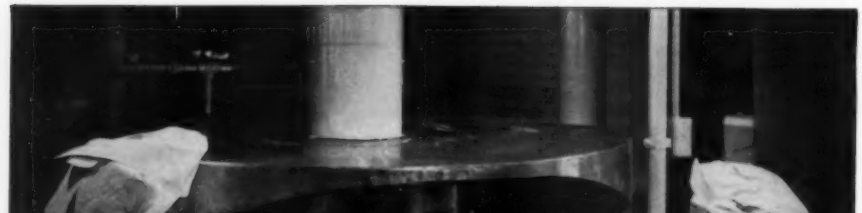
Key items in the taring process are extremely precise transducers. Used to cancel the unbalance in an electrical circuit created by the weight of the empty containers, these transducers consist of a military-type synchromechanism adapted for commercial use. Significantly, these synchros have a standard accuracy of one part in 2,000. Considerably more accurate units, however, are available, depending on the needs of the process.

Making up the Richardson taring system are the following pieces of equipment: weighing platform, scale dial, console instrument panel, and the transducer mechanism that is mounted on the scale dial.

The printer or recorder may be located on the console, at the weighing installation or any place else in the plant. The console would also contain control buttons, relay switches and signal lights. The system has an automatic alarm system that shuts down the operation in whole or in part when anything goes wrong.

Cowles Ultrafast Dissolver

The Cowles Ultrafast Dissolver is now available with three different types of hydraulic lifting equipment. The dissolver that has cut dissolving, dispersing and mixing times by as much as 32 times in some applications can now be purchased with water, air, or oil



This machine (one of a dozen) washes, sterilizes and DRIES glass ampoules at Eli Lilly and Company, Indianapolis. Ampoules placed over needle jets receive a bath of steam, distilled water and DRY air in two complete cycles.

Eli Lilly and Company Takes No Chances with MOISTURE . . .

To preserve the therapeutic potency of many vital drugs, Eli Lilly and Company keeps them DRY and hermetically seals them in DRIED ampoules. After steam and distilled water sterilize each ampoule, warm DRY air flushes out every trace of moisture. Then the ampoules are filled in an extremely DRY atmosphere.

Lectrodryers are strategically placed throughout Eli Lilly and Company plants. They DRY air to prevent moisture interference in drug quality and to help keep production flowing smoothly.

Perhaps DRY air, gas or organic liquid will solve a moisture problem for you. If you have the slightest doubt, write for *Because Moisture Isn't Pink*. This booklet describes Lectrodryers, the amount of DRYness they can supply and how they are working in many industries.

Pittsburgh Lectrodryer Corporation, 309 32nd Street, Pittsburgh 30, Pennsylvania.

A BWC-500 Lectrodryer* stands behind four compressors which supply air to the ampoule washing machines. Air from the compressors at 15 to 20 psi passes through the Lectrodryer, for thorough DRYing, and on to the ampoule washers.

In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In France: Stein et Roubaix, 24 Rue Erlanger, Paris XVI.
In Belgium: S. A. Belge Stein et Roubaix, 320 Rue du Moulin, Bressoux-Liege.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

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*REGISTERED TRADEMARK U.S. PAT. OFF.

lifts to raise the patented impeller and bridge clear of mixing tanks. Use of the hydraulic lift makes it possible to process several different materials with the same machine.

Standard hydraulic equipment on the Ultrafast Dissolver is the water lift. With sufficient water pressure it is not necessary to use auxiliary pumps to raise and lower the hydraulic ram. For manufacturers who do not have an available water supply with an operating pressure of 35-60 PSI, the Cowles Company can now supply either of two alternative systems on their hydraulically operated dissolvers.

The two alternatives are: compressed air operating over oil; and an auxiliary pump that operates a direct oil hydraulic lift. The compressed air system operates over oil in order to smooth operation. Due to the high compressibility of air, more efficient operation is achieved through the use of an oil buffer.

Though the Cowles dissolver is manufactured in several basic models, through standard interchangeable parts, it is possible to create an unlimited number of special high speed dissolving machines through combinations of many different components.

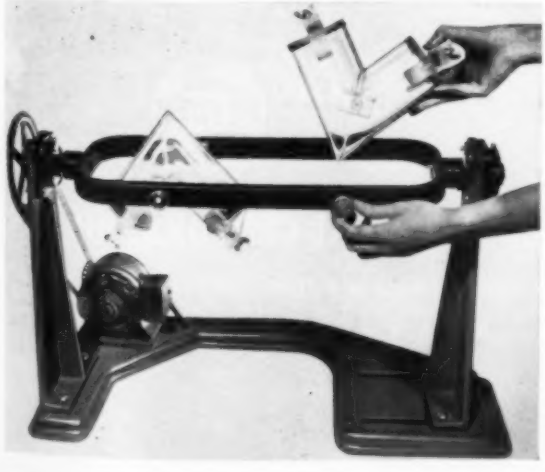
The Cowles patented impeller, that makes the tremendous time saving possible, is adapted by Cowles technicians to each application, making an infinite number of different impellers available to manufacturers in the chemical process, cosmetic, pharmaceutical, plastic, food and related industries.

Information on the new hydraulic lifts and the Cowles Ultrafast Dissolver can be obtained from the Cowles Company, Inc., Cayuga, N. Y.

Lab Blender

To meet a continuing demand for a small scale laboratory twin-shell blender, smaller than the current four-quart size model, Patterson-Kelley now offers the new yoke model which accommodates two small blenders in a yoke which can be interchangeably mounted in the standard four and 8 quart frame. (Patented)

The blender shells are made of heavy, transparent Lucite in load capacities of one, two and four pints with dust and water tight, quick-opening cover plates for easy cleaning. They can be quickly removed from the yoke by loosening a thumb screw.



As in the larger models, the blending action is so gentle that highly abrasive materials will not mar the surface.

P.K. Catalog 12, giving complete information on standard laboratory and production models, and bulletin 405 on the yoke model are available on request to The Patterson-Kelley Co., Inc., 368 Warren St., East Stroudsburg, Pa.

Lab Stone Grinding Mill

A ¼ h.p. electric stone grinding mill of exceptional efficiency in grinding tough, fibrous organic materials, such as cereals, drugs, spices, certain plastics and molding compounds has been included in the wide range of mills being manufactured by the Lee Engineering Company, 2023 W. Wisconsin Avenue, Milwaukee 3.

The mill is adjustable to nine degrees of fineness, from coarse particle size down to finest flour. The material to be ground is centrifugally forced against a stationary abrasive ring of special hardness. An automatic governor permits the exact amount of material to be fed into the grinding chamber to assure efficient grinding. The material is ground to uniform mesh, eliminating the operation of sifting or bolting.

Ventilation of the grinding chamber prevents any heat to develop that may affect the material being ground. The chamber has a simple clean-out.

Capacity depends on the nature of the material to be ground. When grinding wheat into flour the mill has a capacity of eight to 10 pounds an hour. Coarse particle sizes are ground in much shorter time.

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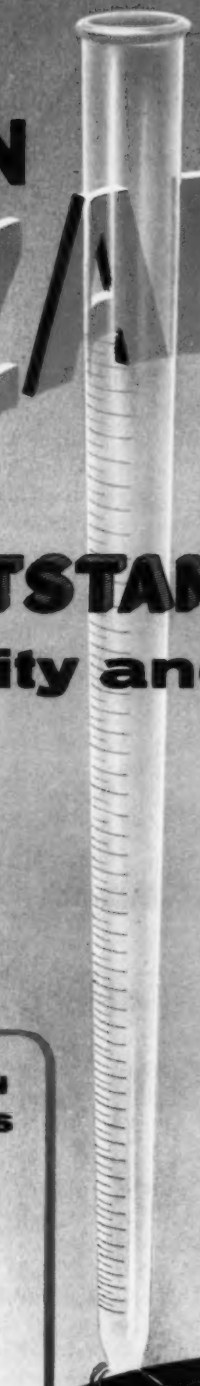

Purity and uniformity are important in any product, for any process application, but these features are particularly vital in the use of Benzaldehyde as an odorant or flavor ingredient. Heyden Benzaldehyde N.F. (F.F.C.) stands out as the product of choice for the manufacture of fine cosmetics and flavoring agents.

The high quality of Heyden Benzaldehyde Technical makes it an advantageous starting material for a growing number of industrial products. It is extensively used as an intermediate for dyes, pharmaceuticals and a variety of organic chemicals.

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Readers' Questions

Dog Shampoo: *We are starting a line of animal products and among the things we would like to introduce is a shampoo for dogs. Can you give us information on such a product? Coral Gables.*

The following dog shampoo has been cited for maintaining the hair and skin in a clean and healthy condition:

Soft soap	16.00 parts
Glycerine	5.00 "
Alcohol	4.00 "
Phenol	0.75 "
Eucalyptus oil	0.50 "
Water, to make	70.00 "

Investigators at the Bureau of Animal Industry are said to have used a stock solution containing 20 per cent coconut oil soap and five per cent orthophenyl phenol diluted with warm water in a ratio of 1:50. The solution was employed as a shampoo for dogs, and found to be effective in killing fleas, promoted healing of cuts and other external injuries, and had no apparent toxic effects even in stronger concentrations.

Coal Tar Solution: *Will you please give us information on the preparation of a synthetic coal tar solution that can be used in the production of dermatologic preparations? It seems to me that I saw a formula for such a solution but I have not been able to locate it. New York.*

A preparation of synthetic coal tar solution was described a few years ago by T. Butterworth and his associates. Their procedure called for the use of:

Anthracene	2.20 parts
Naphthalene	21.80 "
Phenanthrene	8.00 "
Carbazole	4.60 "
Picolene	1.16 "
Pyridine	1.16 "
Quinolene	1.16 "
Phenol	1.40 "
Cresol	1.50 "
Isopropyl alcohol 99 per cent, to make	1000.00 "

The phenanthrene is dissolved first in the alcohol, after which procedure the other ingredients may be added in any order. The result is a straw-colored solution which darkens with age. This synthetic coal tar solution has been used effectively where formerly solution of coal tar N.F. was employed.

Improving Cream Stability: *We are approaching you for help in a problem we are facing in manufacturing a cold cream. The cream we have made has a nice texture and keeps well at lower temperatures, but it melts and the oil is thrown out at higher temperatures. The temperature in our country goes well above 100° F. during the summer and we would like to market a product that will keep well at this temperature and at the same time will not be too hard in texture. Our cream contains white beeswax, hard paraffin, white petrolatum, mineral oil, distilled water, borax and perfume. Calcutta.*

I think you can improve the emulsification properties of your cream and at the same time improve its heat stability by incorporating a small proportion of wool wax alcohols as auxiliary emulsifiers. I would also advise that you mill or homogenize the final cream to improve its all-over stability.

Hormone Cream: *I am interested in obtaining formulas for the preparation of facial hormone creams. Any information which you will be able to give me in this connection will be greatly appreciated. Mexico.*

It is customary in preparing hormone creams that the estrogen content should not be less than 7500 and not more than 10,000 international units of estrogenic potency per ounce of cream. Many bases have been used to make these creams including plain petrolatum and various other fatty ointments. The following formulas for incorporating estrogens were suggested several years ago by Malisoff:

Beeswax	4.0	4.0
Stearic acid	4.0	2.0
Lanolin	10.0	4.0
Cocoa butter	4.0	—
Coconut oil	—	4.0
Olive oil	40.0	—
Almond oil	—	50.0
Borax	1.0	4.0
Water	36.5	31.5

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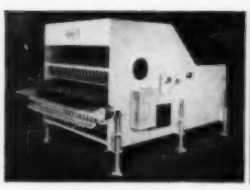

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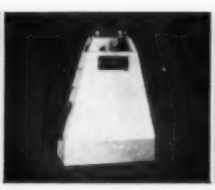

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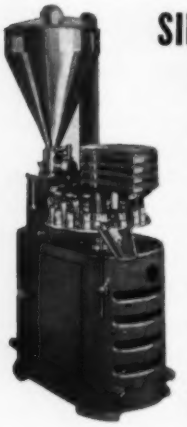

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Industry's Books

Intermediate Botany, by L. J. F. Brimble, B.Sc., formerly lecturer in the University of Manchester, Fourth Ed., Entirely revised and rewritten in collaboration with S. Williams, Ph.D., and G. Bond, PhD., 505 pp., Illus., MacMillan and Co., Ltd., London, (1953), Cloth $4.

This book was first published in 1936 and has passed through three editions (and two reprints). This fourth edition is a fully revised version—new format, many new illustrations, and the text entirely rewritten. The book has been brought up to date in the light of the latest researches, new outlooks and new teaching methods. Many illustrations have been replaced by better ones, and additional illustrations included. This edition should be particularly interesting to students of Science, Arts, Pharmacy, Agriculture, Horticulture and Medicine.

Handbook of Probability and Statistics with Tables, by Richard Stevens Burington, Ph.D., and Donald Curtis May, Jr., Ph.D., 332 pp., Handbook Publishers, Inc., Sandusky, (1953), Flex. binding, $4.50.

The rapid growth of the applications of the theory of probability and statistics to a vast variety of fields has resulted in the publication of many books and articles on the subject. It is the purpose of this book to provide in a small, convenient size a pocket handbook of probability and statistics, sufficiently comprehensive to fill a broad variety of needs, and yet simple enough in its structure to permit use by people having a wide difference of training, background and experience. This book is intended as a convenient summary of theory, working rules and tabular material useful in practical problems in probability and statistics. It brings together information which is not otherwise readily available in simple form except by reference to numerous journals, tables and treatises on the subject. The book is divided into two main parts. The first part includes a summary of the more important formulas and definitions of elementary statistics and probability theory. The second part consists of tables of distributions and other quantities of frequent use in statistical work. The handbook has been compiled to meet the needs of students and workers in statistics, probability, engineering, physics, chemistry, the various natural and social sciences, operations research and analysis, education, business, and other fields in which statistical calculations and methods can be used.

The Production of Antibodies (Monograph of The Walter and Eliza Hall Institute, Melbourne), by F. M. Burnet, M.D., F.R.S., and Frank Fenner, M.D., Second Ed., (1953), 142 pp., MacMillan and Co., Ltd., Melbourne, Cloth, $3.

The authors have here set down their theories and explorations of immunity interpreted in biological rather than chemical terms. The book introduces the "self-marker" hypothesis to underline two aspects of antibody production not previously considered thoroughly: the absence of antigenicity of the body's own constituents, and the failure of mammalian or avian embryos to produce antibody. Through most of its history, immunology has been remote from the general stream of biological discovery and generalization. Here a real attempt is made to show that in future formulations about the nature of living process, the veterinarian, biologist, and medical researcher, must give due weight to immunological phenomena and interpretations.

Silicones and Their Uses, by Rob Roy McGregor, Administrative Fellow, Mellon Institute, Pittsburgh, First Ed., 302 pp. McGraw-Hill Book Co., New York, (1954), Cloth, $6.

Here is an over-all picture of what silicones are and the ways in which they can be used. For engineers, designers, and all who use silicones, this volume provides a correlated source of the available information on properties, preparations, and applications, treated as nontechnically as possible for maximum understanding and usefulness. Types of commercial products covered include silicone fluids, silicone compounds, silicone lubricants, silicone resins, silicone rubber, and "bouncing putty." Representative industries and the uses they are making of silicones are tabulated and techniques of application shown. A short discussion of the price situation is included. Preparation of silicones from the raw material to the finished product is explained in an elementary way to make this information equally helpful to chemists and nonchemists alike. A special feature is a treatment of physiological response to silicones discussing suggestions of ways that silicones—appearing to be without effect from a toxicological point of view—might be usefully employed in both pharmacy and medicine.

Handbook of Differential Diagnosis, by Harold Thomas Hyman, M.D., 716 pp., J. B. Lippincott Co., Phila., (1953), Cloth, $6.75.

This handbook has been prepared for office and bedside use by practicing physicians, by specialists retaining a broad interest in clinical medicine and by those undergraduates, interns and residents who aspire to creative careers in private and institutional practice. Systematized to meet the always exacting and occasionally turbulent demands of realistic patient-management, the text is introduced by a listing of 1585 symptoms and signs, printed on blue paper, reference to any one of which directs the reader to some one of 232 divisions of differential diagnosis, alphabetically arranged. These divisions generally are arranged to the following specifications: an Introduction, concisely summarizing background material; Side Headings, in boldface type, enumerating possible causative mechanisms, usually subgrouped according to etiology (infections, allergic, metabolic, etc.) or Predominant System response (circulatory, respiratory, digestive, etc.); a breakdown of each side head into component Diagnostic Entities, set in boldface type for emphasis; and a terminal Telegraphic Description of each clinical syndrome, limited to pathognomic or highly suggestive symptoms, signs and laboratory data, together with indicated therapeutic tests and suggestions.

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Advancing Therapy

Anticholinergic Drugs in Peptic Ulcer

It is pointed out by J. M. Ruffin, E. C. Texter, Jr., D. D. Carter and G. J. Baglin (*J.A.M.A.* 153:1159, 1953) that anticholinergic drugs have been introduced recently into clinical medicine. The cholinergic blocking agents currently available include methantheline (Banthine), diphenmethanil (Prantal), oxyphenonium bromide (Antrenyl), and propantheline bromide (ProBanthine). A large number of similar compounds are under investigation at the present time. As with other new agents that have been employed in the past in the treatment of peptic ulcer, the initial reports of the value of these drugs were glowing with enthusiasm.

Because of the confusion regarding the actual usefulness of these agents, Ruffin and his associates made an evaluation of these drugs. They observed that with the advent of the anticholinergic drugs, the profession has at its disposal, for the first time, agents that are effective in reducing both secretory and motor activity of the stomach. These drugs have been proved extremely useful as adjuncts to conventional management of active peptic ulcer, whether duodenal, gastric, or marginal. Their most striking clinical effect is the relief of ulcer pain, which is frequently dramatic after parenteral administration. It is of interest to note that this relief of pain is synchronous with cessation of gastric motility despite artificially produced high acid values. Relief of pain, however, is not necessarily indicative of healing as ulcer craters have been observed to persist for weeks or months under treatment even though the patient was symptom-free. There are no accurate data on the effect of these drugs on the healing time of ulcer. In fact, measurement of the healing time in duodenal ulcer is so difficult that it is doubtful that such data can be obtained. These agents have been disappointing in the long-term management of ulcer, since recurrences are not prevented and the incidence of complications or the need for surgery are not significantly altered by their prolonged administration. It should be emphasized that these drugs are not necessary in the management of the simple, uncomplicated ulcer.

The investigators express the hope that more effective compounds will be developed that will enable physicians to control more satisfactorily, if not to prevent, the recurrences and complications of peptic ulcer.

Medication for Aged Mental Cases

The value of various stimulatory, vasodilatory, and enzymatic drugs in the treatment of aged persons hospitalized in a state hospital for the mentally ill was studied by S. Levy (*J.A.M.A.* 153:1260, 1953). He found that the greatest improvement for this type of patient was obtained with a combination of pentylenetetrazol (Metrazol) and nicotinic acid. These drugs were combined in an elixir containing per drachm three grains (0.2 Gm.) of pentylenetetrazol and 100 mg. of nicotinic acid with compound pepsin elixir as the vehicle. It was given in doses of one drachm three times a day. This elixir produced physical improvement in the patients both objectively and subjectively, produced a marked improvement in their behavior and a better performance on psychological testing with an increase in the intelligence quotient, restored to normal previously abnormal blood lactic acid values, and restored to normal some of the previously abnormal electroencephalographic tracings.

On the basis of this study, Levy feels that the combination of pentylenetetrazol (an analeptic) and nicotinic acid (a vasodilator) is of value in the treatment of aged patients hospitalized in an institution for the mentally ill. It is particularly helpful for those with only mild memory defects, confusion, and deterioration in the absence of more serious emotional and psychiatric disturbances. It seems especially helpful in combating symptoms of abnormal behavior, and those are the symptoms that are most objectionable to the family members and relatives. On the other hand, symptoms pertaining to intellectual impairment are not combated so effectively with this combination of drugs. This might be due to the fact that intellect and memory are first to suffer, while personality and behavior changes occur later. Thus it may be assumed that the former phenomena depend on more definite organic changes that may be irreversible, while the latter symptoms, those dealing with impaired behavior, to some extent may still be reversible.

This combination has proved safe and simple as well as practical and inexpensive, and thus can be used without hesitation on an ambulatory basis. With its use it should be possible to ease the burden of caring for the mildly confused and mildly deteriorated aged patients in public and private psychiatric institutions.

Dextran as an Anticoagulant

Until recently, say C. R. Ricketts and his colleagues (*Lancet* 2:1004, 1953) the choice of drugs for anticoagulant therapy has lain between heparin and one or another of the coumarin derivatives. Heparin, though in many ways an ideal anticoagulant in allowing considerable latitude of dosage with safety, has certain disadvantages: (1) it necessitates frequent parenteral administration; and (2) since it is derived from animal tissues, it is difficult and expensive to extract and purify, it gives rise occasionally to sensitization reactions, probably from the presence of protein impurities, and when derived from different sources it seems to vary in chemical composition and physical characteristics. Of importance, therefore, is that their clinical experience with 20 cases in which dextran sulfate was administered in various dosages and for various periods, from a single injection to continuous therapy for seventeen days, suggests that dextran sulfate is an effective anticoagulant producing a response qualitatively resembling that of heparin but lasting somewhat longer. No serious side-effects have yet been observed.

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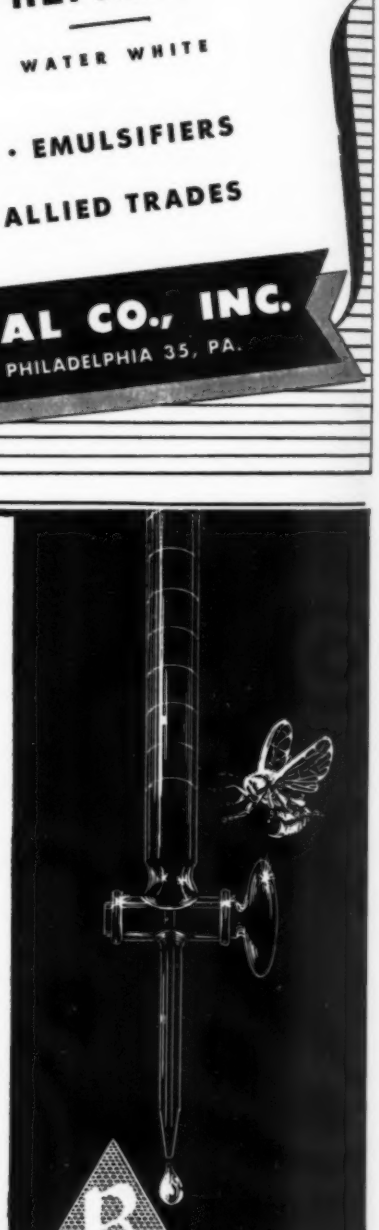

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From these studies, Ricketts and his associates are of the opinion that dextran sulfate resembles heparin in being comparably safe and non-toxic, in being quick-acting, in losing its effect rapidly on withdrawal, and in its capacity for neutralization in emergency. It must also be administered parenterally, but its somewhat greater duration of anticoagulant effect allows its administration at longer intervals. The control of therapy requires no more elaborate investigation than estimation of the clotting-time before each injection. The relative ease of its manufacture should allow cheaper production. Since it is synthesized from purified protein-free material (dextran) it seems unlikely to give rise to protein-sensitization reactions, and it can be produced to specified chemical and physical characteristics.

Combined Therapy of Rheumatoid Arthritis

Forty-four patients with active rheumatoid arthritis were treated by C. J. D. Zavafonetis, W. A. Steiger, I. W. Ginsburg and A. J. Heather (*Arch. Internal Med.* 92:204, 1953) with a combination of *p*-aminobenzoate and acetylsalicylic acid. The potassium salt of *p*-aminobenzoic acid was given in six doses daily of 2 Gm. each. Generally 20 cc. of a 10 per cent solution of potassium *p*-aminobenzoate was taken with each meal and midmorning, midafternoon, and at bedtime. Acetylsalicylic acid was administered in a dosage of 0.6 Gm. four times daily taken at mealtime and at bedtime. Of these patients, 34 showed functional improvement evidenced by increased range of motion, striking weight gain, and diminution in joint heat, swelling, pain, and tenderness. Although striking improvement was occasionally seen after two or three weeks, the more usual course was a gradual betterment that culminated in significant improvement after three months of treatment. This improvement was maintained for from six to 18 months. Untoward reactions were minimal and readily reversible when use of the drugs was discontinued. Three patients had relapses when placed on placebo therapy. Two of these were treated again, with highly satisfactory suppression of the disease process. Three additional patients had relapses when treatment was stopped deliberately or because of intercurrent illness. Resumption of therapy was again followed by improvement.

The investigators feel that the relationship between therapy and response has been too consistent to be attributed to chance remission. It is stressed that this treatment program does not cure rheumatoid arthritis. It appears logical to conclude that a true synergism is exerted by high dosage of *p*-aminobenzoate with acetylsalicylic acid. The combined use of these drugs is suppressive therapy, which frequently results in significant functional improvement.

Terramycin in Dermatoses

Oxytetracycline (Terramycin) was used by H. M. Robinson, Jr., A. Shapiro, I. Zeligman and M. M. Cohen (*South. Med. J.* 46:773, 1953) for the treatment of 1,194 patients with various dermatoses. Of these, 466 received the drug by mouth and 728 were treated with the local application of three per cent ointment. Of the patients given the drug by mouth, 129 were definitely benefited, 197 were occasionally, temporarily, or partially improved, and 140 were therapeutic failures. Definite benefit from oral administration of oxytetracycline resulted in all conditions in which pyogenic organisms were the primary cause of the disease. Oral administration of the drug was of value in the treatment of secondary pyogenic invasion of eczema, epidermophytosis, stasis ulcers, and seborrheic dermatitis but had no beneficial effect on the primary disease The lesions of granuloma inguinale healed rapidly after the institution of oxytetracycline orally, and no relapses were noted. The lesions of erythema multiforme responded to treatment with oxytetracycline capsules in 17 of 24 patients. No blood dyscrasias were observed in the 466 patients. Of the patients who received local application of oxytetracycline ointment, 302 were definitely benefited, 251 were occasionally, temporarily, or partially improved, and 175 were therapeutic failures. There was rapid healing of pyogenic infections, such as impetigo contagiosa and ecthyma. Oxytetracycline ointment was also of value in the treatment of many skin eruptions complicated by secondary pyogenic invasion but had no effect on the basic dermatosis. A contact sensitivity to the drug developed in 11 patients treated with oxytetracycline ointment. All these patients gave a positive reaction to patch tests with oxytetracycline powder, establishing this as the cause of the reaction, while they had negative results from control tests of the lanolin and petrolatum ointment base.

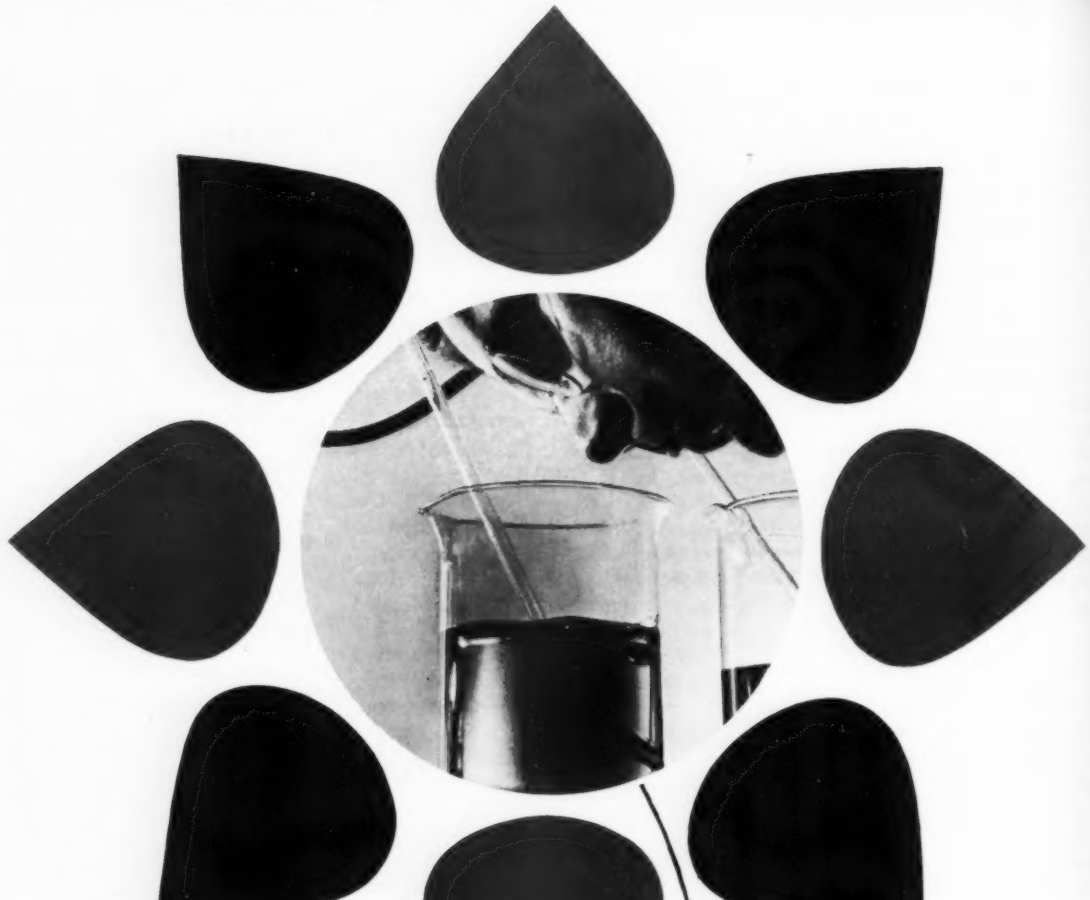
Hence it is concluded that ocytetracycline is a valuable addition to the drugs already in use for the treatment of skin disease, but, as with all antibiotics, it should be used only where there is a specific indication.

Nicotinamide and Joint Mobility

According to W. Kaufman (*Connecticul State Med. J.* 17:584, 1953) the dimunition in point mobility which occurs with advancing age can be counteracted by large oral doses of nicotinamide. His conclusions are based upon a series of 606 patients treated in this way. The dosage schedule ranged from 900 mg. to 4000 mg. daily, in divided doses, depending upon the severity of joint dysfunction. The improvement in joint mobility persists only so long as treatment is maintained. Discontinuance of therapy causes a gradual regression in joint mobility until the patient reaches the level of joint mobility that he had before treatment was started. Reintroduction of niacinamide [nicotinamide] treatment results once more in improvement in joint mobility. No untoward effects were noted from prolonged administration of these relatively large doses. The value of such treatment in geriatrics is stressed.

Penicillin Dentifrice and Dental Caries

A study has been made by T. J. Hill, J. Sims and M. Newman (*J. Deul. Res.* 32:733, 1953) on the effect of a paste containing the procaine salt of penicillin on the control of dental caries. The children used in the experiment were from a public school, and the use of the dentifrice was regimented to the extent of one brushing each day. There were 347 in the experimental group and 145 in the control group, all within the ages of 7 to 12. At the end of one year's study the experimental group had 9.7 per cent less DMF (decayed, missing, filled) teeth, 15.9 per cent less surfaces involved and 14.5 per cent less lesions than the control group. The data indicate that the use of the paste led to a slight reduction in dental caries but not of sufficient magnitude to conclude that a dentifrice used irregularly in an unregimented program would be of material value in the reduction of carious lesions. No significant changes in lactobacillus counts were observed. Allergies did not present a clinical problem.



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Compounder's Corner

Hair Oils and Brilliantines

There is no sense, says F. Milos (*Alchimist* 7:145, 1953), in differentiating between hair oils and liquid brilliantines because both serve the purpose of oiling and fixing the hair. He notes that the manufacture of liquid brilliantines and hair oils is not complicated. A hair oil should be crystal clear and should not become turbid when cold. Therefore filtration should be done in the cold to obtain good crystal-clear transparency, and a suitable perfume essence is necessary. Generally perfumes dissolve well in vegetable oils but not so easily in petroleum jelly. Essence manufacturers will be able to offer special compounds for such purposes. Most hair oils are colored green, yellow, red or brown. Generally fat soluble aniline colors are used, also chlorophyll for green, saffron tincture for yellow and alkalin for reddish tints.

Vegetable oils should only be used when suitably preserved. They are subject to oxidation when in contact with the air and should be preserved with esters of *p*-oxybenzoic acid. Only best qualities of oil, duly refined and freed from acid should be used. Other suitable preservatives are resinoids of Peru and tolu balsams.

In presenting examples of hair oil, Milos cites the following formula for an artificial macassar oil:

Petroleum jelly	**1000.0 parts**
Olive oil	**1000.0 "**
Bitter almond oil	**1.0 "**
Vanillin	**0.8 part**
Ylang-Ylang oil	**0.5 "**
Heliotropine	**0.2 "**

Both solid brilliantines and hair pomades serve the purpose of fixing the hair and oiling it and also to give it a good gloss. The basic material for solid brilliantines or crystallized brilliantines generally is petrolatum. The consistency is regulated according to the climate with paraffin oil, spermaceti, ceresin, rosin, and the like. Crystallized brilliantines have been superseded by a transparent brilliantine. Solid brilliantines are generally colored yellow, green or reddish. Oil soluble colors are generally used with the proportion of perfume 0.5 per cent to one per cent on an average. Basic formulas for making solid brilliantines are as follows:

Stearin		**200**	
White petroleum jelly	**600**	**50**	**400**
Paraffin oil	**130**	**700**	**400**
Clear rosin	**130**		**100**
Lanolin	**120**	**50**	**100**

Stick type hair pomades may be formulated from the following materials:

Tallow	**500 parts**
Ceresin	**150 "**
Cacao butter	**300 "**
Beeswax	**50 "**

So-called hair fixatives, based on mucilaginous substances, are prepared on the basis of the following typical examples:

I

Lemon pectin	**3.0 per cent**
Glycerine	**3.0 " "**
Alcohol	**1.0 " "**
Citric acid	**0.5 " "**
Distilled water	**92.5 " "**

II

Tragacanth, in powder	**0.2 " "**
Alcohol	**2.0 " "**
Glycerine	**3.0 " "**
Distilled water	**94.8 " "**

To dispense the fixatives in tubes, the percentage of mucilage is simply increased, so that their consistency increases, as in the following examples:

I

Tragacanth, in powder	**4.5 per cent**
Gum arabic	**0.5 " "**
Glycerine	**5.0 " "**
Alcohol	**5.0 " "**
Distilled water	**85.0 " "**

II

Gelatin	**3.0 per cent**
Agar-agar	**0.5 " "**
Gum arabic	**0.2 " "**
Distilled water	**96.3 " "**

It is recommended that the preservation substances be dissolved in the alcohol which then should be added into the mass.

Hair lacquers, says Milos, should be easily removed from the hair by simply shampooing. Simple alcoholic rosin solutions (shellac) are not suitable because they stick to the hair and cannot be removed easily. Shellac is made water soluble by milk alkalis (triethanolamine, borax), so that removing it from the hair does not give any trouble. The following composition is indicative:

Shellac (natural orange)	**8.0 per cent**
Triethanolamine	**1.5 " "**
Alcohol	**20.0 " "**
Distilled water	**70.5 " "**

Lipstick Dermatitis

In reporting two cases of lipstick dermatitis, B. Solomons, Jr. (*J. Irish Med. Assoc.* 33:104, 1953) remarks that it is curious that a substance as complex as lipstick, which is continuously applied to the skin, should cause so few reactions. One of his cases was a woman of 32 who had used lipstick for 15 years, and the particular offending brand for four years before she developed the condition. The lesion was confined to the lips. Patch tests to all the constituents of the lipstick were negative. She was able to use any other brand of lipstick without adverse effect. The other patient was a woman of 27, who had used lipstick for 11 years and was accustomed to wearing five or six different brands. Here the reaction consisted of swelling, redness and scaling of the lips, and redness and scaling of the cheeks and peri-orbital areas. The anterior part of the tongue was bright red. On a subsequent occasion the eruption spread to the neck, front of the chest, arms, thighs and legs. Patch-testing proved positive to each one of her lipsticks, and the sensitivity was finally tracked down to the eosin. She could use a non-allergenic lipstick. It is pointed out that the non-allergenic type of lipstick is generally objected to on account of its relative impermanence.

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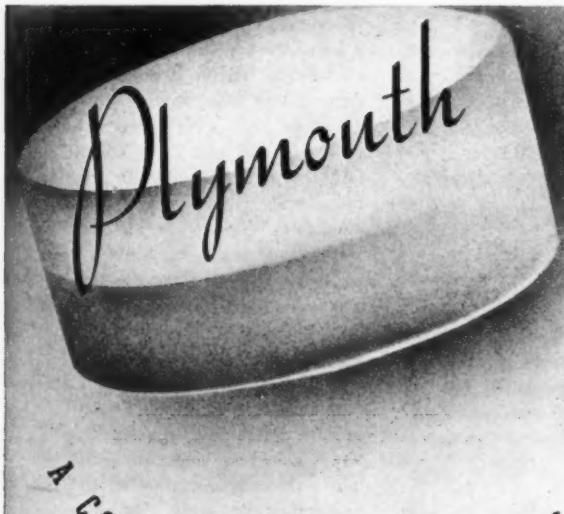

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Solomons observes that hardening of the lips to a lipstick containing a dye which has proved harmful may be attempted after a free interval of at least three months, but it scarcely ever meets with success. A hopeful prognosis can be given only when the incubation period is short. Although the diagnosis is usually easy, the following causes should also be borne in mind: actinic dermatitis, cold urticaria, dental plates, denture creams containing aniseed oil, toothpastes, cigarette holders, menthol-ated cigarettes, nail polish, and orange oil in bubble gum, while "such an unconsidered danger as a husband's moustache wax" should not be overlooked.

Vitamin B_{12} Injections

In a report on vitamin B_{12} injections presented before the 1953 British Pharmaceutical Council, N. Baxter, J. Horsford, F. Wokes, F. W. Norris and S. J. G. Fernandes (through *Pharm. J.* 171: 221, 1953) state that under suitable conditions, cyanocobalamin (vitamin B_{12}) can be converted to hydroxocobalamin (vitamin B_{12b}), a compound of apparently equal physiological activity. Such a change is particularly likely to occur in solutions under the influence of light. A method, based on microbiological assays of vitamin B_{12} activity before and after destruction of hydroxocobalamin with ascorbic acid, was used to check a spectrophotometric method of determining cyanocobalamin. Subsequently, this latter method was applied to 66 different batches of injection.

A survey of the results shows that, while most vitamin B_{12} injections had a cyanocobalamin content lying between 90 and 110 per cent of the claim, in some batches this content was well below the claim—probably due to conversion of cyanocobalamin to hydroxocobalamin by the action of light. This conversion took place readily in the *p*H range of the injections (3.5 to 6.5) and could be prevented by storage in the dark. The cardboard boxes ordinarily used to contain ampoules did not appear to provide sufficient protection. However, when ampoules containing vitamin B_{12} injections in which hydroxocobalamin had been formed by the action of light were subsequently stored in the dark, the hydroxocobalamin tended to revert to cyanocobalamin. The investigators conclude that the cyanocobalamin content of most of the vitamin B_{12} injections at present in use in the United Kingdom, when related to the claimed content, appears to be higher than is permitted in the B.P. 1953. They suggest that the present upper limit of 96.5 per cent of the claim should be increased a little, in order to avoid loss of much valuable material.

Adhesive Tape Remover

According to a note in the *Bulletin of the American Society of Hospital Pharmacists* (10:313, 1953), the following simple preparation will be found useful as a non-inflammable adhesive tape remover.

Carbon tetrachloride	**80.0 cc.**
Mineral oil, to make	**100.0 cc.**

Waxes in Cosmetics

In discussing the role of waxes in the cosmetic industry, L. Ivanovszky (*Soap, Perf. Cosmetics* 27:919, 1953) points out that paraffin wax and ceresin are traditionally and currently important raw materials for the manufacture of cosmetics and pharmaceuticals. Genuine ceresins (i.e. unadulterated, good grades of refined ozokerite) already became, prior to the second World War, very rare products. Refined ozokerites contained as a rule at least 70 per cent of paraffin wax, while "ceresin" had become synonymous with opacified and sometimes with hardened paraffin wax. Not infrequently, paraffin wax, simply remolded into blocks, was sold as ceresin. In many instances, certain of the hard, microcrystalline petroleum waxes and plastic petrolatums serve as a perfect replacement material for genuine ozokerite. The characteristic properties of genuine ozokerites microcrystalline waxes, and petrolatums are their capability of depressing crystallinity, binding crystalline waxes and solvents to homogeneous systems, and increasing the retention of volatile solvents and of fixed oils. Ozokerites and the like, as a rule, decrease the solvent absorption power of the other waxes, if added to them in excess of a few per cent.

Beeswax has a somewhat similar effect to that of ozokerite. It is, however, of a lower order, and sometimes accompanied by less desirable properties. Carnauba wax increases the solvent absorption power. In other words, it has a pronounced stiffening action. Candelilla wax behaves somewhat similarly to carnauba wax, but its effect in both directions is less pronounced.

In discussing the function of these materials, Ivanovszky notes that, in contrast to almost all the other wax-using industries, the ability to produce gloss is not always among the requirements for waxes employed in the manufacture of cosmetics and pharmaceuticals. In point of fact, this property would, as a rule, be undesirable, but in certain cases (e.g. lipsticks and hair creams) it may be essential. The peculiar gloss effect of such preparations is, however, primarily due to the properties of their fatty constituents.

In actual use, the waxes found their earliest employment in the water-free, semi-solid ointments and creams. These preparations, the oldest "cosmetics," serve mainly to keep the skin soft by providing emollient action. As a rule, such ointments contain mineral and vegetable oils as their liquid components. In addition to beeswax, these preparations may also contain stiffening and modifying agents like other waxes and related products such as spermaceti, cetyl alcohol, stearic acid, ceresin, ozokerite, paraffin wax, and petrolatum.

Cold creams, which can be regarded as a development stage of the ointments, consisted originally of white wax (i.e. beeswax), oil of almonds, rose-scented water, and some borax. The modern preparations contain besides beeswax other waxes, such as spermaceti, paraffin wax, "ceresin," and sometimes carnauba wax.

In considering almost solid to solid preparation such as sticks and pencils, Ivanovszky states that in this connection lipsticks, eyebrow and make-up pencils, deodorant sticks, and epilating waxes have to be mentioned in the first place. With the exception of the last mentioned cosmetic, they can be more or less correctly described as stiff ointments with a fairly high content of waxes.

Lipsticks contain, besides beeswax, carnauba wax, candelilla wax, "ceresins," ozokerites, and paraffin waxes, also hydrogenated castor oil. In addition, other hydrogenated oils, cetyl alcohol, glyceryl monostearate and the like are used. The main sem-solid constituents are lanolin, petroleum, jelly, cocoa butter, and lard. The oily components, are chiefly mineral oils and castor oil.

In their qualitative composition, the three other preparations differ little from that of the lipsticks.

Epilating waxes, however, consist approximately of equal parts of rosin and mixtures of waxes (such as carnauba wax, beeswax, paraffin wax), with the addition of a few per cent of petrolatum and oils or both.

Animal Health

Modified Hog Cholera Vaccine

The studies reported by R. C. Percival, M. J. Harvey, T. James and H. Koprowski (*Vet. Med.* 48:359, 1953) indicate that durable immunity to hog cholera for at least two years was conferred by vaccination with a modified live virus vaccine, called Rovac, which had been serially passed in rabbits 250 times. The evidence shows that this immunity was the result of vaccination alone, as there was no chance exposure to hog cholera virus since all contact control animals remained susceptible throughout the experiment. By analogy with results obtained with other live virus vaccines in both man and animals, it is probable that Rovac will confer immunity which, for all practical purposes, may be regarded as lifelong for the hog.

Vitamin D for Milk Fever

Milk fever, say J. W. Hibbs and W. D. Pounden (*Ohio Farm & Home Res.* 38:108, 1953), is a serious disease of cattle typically associated with the time of calving and beginning lactation. It is accompanied by sudden paralysis, gradual loss of consciousness, and usually results in death if the animal is untreated. Despite the reduction in mortality, there is still considerable hazard connected with a milk fever attack. These hazards form the basis for a need of some relatively simple method of preventing milk fever from occurring.

Vitamin D has long been associated with the metabolism of calcium and phosphorus. It was this knowledge which first prompted its use as a possible milk fever preventive. At present vitamin D feeding is a reliable means for warding off an attack. Briefly speaking, the procedure calls for feeding massive doses of vitamin D (30 million units per day) for from five to seven days before the calf is born. Form of the vitamin D in this experiment was either oil concentrated irradiated ergosterol or type 142-F irradiated dry yeast. One of the problems involved in the success of this method of prevention is predicting the freshening date so that vitamin D feeding can be properly timed. Work done at the Ohio Station has indicated that by feeding the massive dosage, blood calcium and phosphorus levels maintain a higher-than-normal level through the critical period after calving. This affords protection against milk fever and indicates that this method of prevention is physiologically sound.

Other recently completed investigations have shown that no harmful effects are likely to occur from feeding large doses of vitamin D during the short time needed for milk fever prevention. Prolonged feeding of vitamin D was shown to be definitely harmful to the cows.

Plasma Substitutes in Dogs

In bleeding and transfusion experiments, R. Clark, W. D. Malherbe and K. E. Weiss (*J. So. African Vet. Med. Assoc.* 24:87, 1953) found that dextran preparations caused no visible untoward reactions in dogs. However, polyvinylpyrrolidone caused acute symptoms of shock and collapse of blood pressure in dogs on the first injection. The severity of this reaction decreased with subsequent infusions, and could be reduced to a marked degree by administering antihistaminics prior to the transfusion. The administration of antihistaminics after the onset of shock did not alleviate the symptoms or hasten recovery.

Growth Factor in Animal Proteins

It is noted in *Agriculture and Food Chemistry* (1:1093, 1953) that an unidentified growth factor in animal proteins increases the growth rate of a fast growing strain of chickens. The factor, present in meat scraps, fish meal, and fish solubles, was described by H. R. Bird, at the convention of the National Renderers' Association. Ten-week-old chickens fed a diet including fish meal weighed an average of 0.38 pound more per bird for male birds and 0.21 pound more per bird for females than control lots fed a complete diet entirely from plant sources.

There is evidence that the new factor is supplied by some fermentation products, such as the antibiotic residues. It also appears to be synthesized by certain bacteria. Autoclaving at pH's ranging from two to 11 does not destroy the factor. The substance is water soluble. So far it has not been isolated. The biggest difficulty here is the lack of a suitable assay. Response in chick growth is the only known means of detection. The substance has been shown not to be vitamin B_{12} by including crystalline B_{12} in excess of requirements in the diet.

BHC for Mange in Dogs

In a report presented to the 15th International Veterinary Congress in Stockholm in 1953, A. Borchet (through *Vet. Rec.* 65:823, 1953) stated that while hexachlorcyclohexane, also known as benzenehexachloride or BHC, in dips effectively cures mange in dogs it fails to cure demodectic mange of dogs. He had found by feeding bugs on small animals that subcutaneous or oral administration of BHC was followed by the appearance of the drug for a short time in the blood stream and he had therefore used these methods of administration for the treatment of dogs infected with *Demodex*. Directly after this treatment there was a more or less marked migration of all stages of the mites out of the hair follicles on to the surface of the body, where it was possible to attack them with substances toxic to them.

Borchet stresses that treatment must take into account the biology of the mites. The dog's resistance and general condition should be improved by giving it good and varied food rich in vitamins and by skin massage and general care of its body; but baths should not be too frequent. Causes of other diseases, and worms especially, should be removed. Borchet treated 17 dogs and obtained complete cure of 16 suffering from pustular and squamous demodectic mange. For treatment he used four to five per cent solutions of BHC (total isomers) or of gamma-BHC in poppy oil. Dosage used varied according to nutritional state, age and degree of dis-

ease from 20 to 80 mg. of the technical material per kg. bodyweight and from 10 to 20 mg. per kg. of gamma-BHC. Subcutaneous administration may be accompanied by abscess-formation at the injection sites, but there is the great advantage that marked healing of the pustular type of mange takes place in a few days. Abscess formation does not occur when the drug is given orally, but the dose must then be calculated very carefully, because overdoses may affect the kidneys and liver. The death of one of the 17 dogs treated was due to rubbing the drug in oily solution into the skin. Absorption from the skin occurred and, although the subcutaneous dose given was small, this well-no ırished and only lightly affected Boxer dog died.

BAL Therapy by Thallium Poisoning

From experimental studies, E. Lienert and E. Sebesta (*Wien. Tierarztl. Monatsschr.* 40:327, 1953 through *Vet. Med.* 48:512, 1953) found that dogs poisoned with 30 mg. thallium sulfate per kg. body weight were saved by BAL (British Anti-Lewisite) if treatment with this antidote could be initiated within the first hour after poisoning. Treatment failed after marked symptoms of intoxication had appeared. In poisoned cats BAL proved ineffective. The dosage for dogs is 4 mg. of BAL per kg. body weight every four hours during the first two days, and every six hours on the third day; from the fourth to the eighth day, two injections are given daily.

Experiments on Vibriosis Therapy

In experiments on the curative treatment of vibriosis, O. Garm, H. Hoff and Skjerven (*Nord. Vet. Med.* 5:401, 1953 through *No. Amer. Vet.* 34:774, 1953) found that intraperitoneal inoculation of *Vibrio fetus*, during the fifth or sixth week of pregnancy, caused abortion in most guinea pigs in two to six days. *Vibrio fetus* could be isolated from the genitals, placentas and fetuses in 62.9 per cent of abortive cases. Abortion could be prevented by giving 30 mg. dihydrostreptomycin intramuscularly for the first four days after inoculation. The guinea pigs so treated gave birth to viable, fully developed young, and *Vibrio fetus* could not be demonstrated in the tissues of the dams or of the newborn. Several organic arsenicals, given intravenously or by mouth, had no effect on the frequency of abortions.

Local treatment of the penis with an antibiotic cream, in one infected bull, resulted in a return to a normal pregnancy percentage following service by this bull, and he no longer infected heifers.

High Blood Pressure in Chickens

According to P. D. Sturkie (through *Science News Letter* 64:373, 1953), high blood pressure is one of the causes of death in old chickens. After perfecting a method of taking the blood pressure of birds, he discovered that blood pressure increases in birds with age just as in humans. The blood pressure of male fowl is much higher than female.

The research was stimulated by the fact that about half of the adult birds lost each year die of non-infectious diseases and old age. This study established that one cause of death in old birds was high blood pressure. The percentage increase in blood pressure in chickens 10 to 42 months of age is almost the same as in human beings 20 to 65 years of age. On the basis of this experiment, poultry breeders may be able to increase the life span of chickens by selecting for breeding purposes those hens whose blood pressure does not change much with age.

Chloromycetin in Infectious Keratitis

W. F. Riley, Jr. and R. D. Barner (*J. Am. Vet. Med. Assoc.* 123:434, 1953) have carried out a limited clinical evaluation of the effectiveness of various therapeutic agents commonly employed in inflammatory diseases of the eye in cases of infectious ovine keratitis, which is a pink-eye type of ophthalmia in sheep. Chloromycetin was used, in an ointment base, having a concentration of 200 mg. of chloromycetin in 3.8 Gm. of ointment. Preliminary results indicate chloromycetin to be effective in the treatment of infectious ovine keratitis. As a rule, mild cases showed improvement within two to three days, and appeared normal in about one week. More severe cases required applications twice daily for four or five days, after which once daily for another four or five days proved sufficient in most animals. The degree of clinical improvement served as a guide to the frequency and the duration of treatment. Segregation was practiced in every possible instance. In those flocks where the outbreak was immediately preceded by the purchase of purebred breeding stock (often a new ram) from some outside source, it was felt desirable to medicate those newly purchased animals also, even though they were not visibly affected. It was felt that in this way the danger of the carrier state might be minimized.

Supplemental Methionine for Chickens

Data showing the effect of supplemental DL-methionine and change of level of protein on the growth and feed efficiency of broilers have been presented by H. Menge, C. A. Denton, H. R. Bird and G. F. Combs (*Poultry Sci.* 32:827, 1953). The results were obtained from an experiment conducted simultaneously at the Agricultural Research Center and the University of Maryland in which a total of approximately 1,500 chicks were used. These data show that supplemental DL-methionine was of value in improving both rate of growth and feed efficiency of broilers to six weeks of age at both stations. However, methionine was of no value at Beltsville during the period from six to 10 weeks of age, although it did continue to improve both the rate of growth and the feed efficiency at the Maryland station. When the entire 10-week period is considered, supplemental methionine was of more value in improving both the rate of growth and the feed efficiency of broilers at Maryland than at the Beltsville station. This can be attributed to the fact that methionine gave a response at Maryland during the entire experiment, whereas, it did not give a response during the latter part of the experiment at Beltsville. Since the chicks were obtained from the same source and identical rations were used, it seems probable that environmental factors account for the inconsistency.

The different levels of protein tested had no substantial effect on the value of supplemental methionine during the period from six to 10 weeks of age. The data also suggest that the protein level of broiler rations may be reduced to 19 per cent after the birds are six or eight weeks of age without affecting the rate of growth or the efficiency of feed utilization.

When the level of protein fed to males was reduced from 22.4 to 15.8 per cent at either six or eight weeks of age, the rate of growth was retarded to a greater extent than when this same change was made with females. These results indicate that the protein requirement of males is somewhat higher than that of females after 8 weeks of age.

Perfumer's Shelf

Capsaicin

It is now quite well established says A. A. Newman (*Chem. Prod.* 16:413, 1953) that capsaicin is the only substance responsible for the distinctive pungency of the fruits of the capsicum or red pepper family. Capsaicin has the composition of $C_{17}H_{25}O_3N$ with the corresponding name of 8 - methyl - non(6)en - (1)oic acid - (1) - [4 - oxy, 3-methoxy-benzyl-amide].

The extraction of the pungent principle from suitably prepared plant substance can be carried out by a variety of solvents, such as methyl, ethyl, *iso*-propyl and other alcohols, acetone and other ketones, ethyl ether, petroleum ether, paraffin fractions, chloroform, and others. Not all of these solvents will extract the same amount of substance from a given sample. Generally speaking alcohols will extract a much higher proportion than, for instance, ethyl ether. The actual percentage may vary from 25 to 10 per cent or under. The amount of capsaicin present in the fruit may vary between wide limits. Generally speaking the highly pungent varieties will contain more (often five times more) than the milder sorts. This yield may vary from 0.03 per cent or less to 0.14 per cent or more. There are also varieties which contain no capsaicin at all.

In considering the properties of the compound, Newman states that capsaicin is easily soluble in alcohols, ethers, ketones, chloroform, paraffin oils, benzene and its near homologues, and also in caustic soda and potash solutions. It is sparingly soluble in carbon bisulfide and concentrated hydrochloric acid. It is insoluble in cold water, but water vapor may entrain very small amounts of the compound. Capsaicin is very resistant to the action even of hot concentrated alkalis, cooking under pressure being required to achieve cleavage of the molecule. Capsaicin is fairly resistant also against concentrated acids, but prolonged boiling may lead to loss of some nitrogen.

The melting point of capsaicin is 64.5° C., but preparations melting between 64 and 65° C. may be considered as satisfactory. When sufficient heat is applied, capsaicin will volatilize to some extent. At a vacuum of 0.1 mm. mercury capsaicin is distillable without decomposition, provided the outside temperature is kept between 210 and 220° C. This latter property has been used to obtain the pure compound from partially purified concentrates.

In discussing the physiologic action and therapeutic value of capsaicin, Newman observes that it is an effective stimulant, and can be used both internally and externally. When taken internally, it is generally ingested in the form of tincture, and will act as a carminative relieving gastric flatulence associated with dyspepsia. Externally, applied in the form of tincture, ointment, or plaster, impregnated cotton or the like—it will act as a rubefacient giving relief from rheumatism, lumbago and neuralgia. Clinical experiments carried out in the course of the last few years have shown that capsaicin can inhibit the growth of mouse tumors and that it has a definite action on the heat-regulating mechanism of mice and guinea-pigs in solutions as dilute as 1.4 μg. per liter when introduced into the body by means of subcutaneous injections.

Capsaicin is one of the most pungent compounds known, and even the smallest trace of it will cause a burning feeling on the tongue or in the throat. Capsaicin vapors are highly irritating and may cause acute discomfort to the eyes, nose, tongue and throat. Finally, capsaicin particles in contact with the throat may cause violent and prolonged coughing fits which may lead to nervous exhaustion of the sufferer. A patent (1,659,158) taken out in the U.S.A. in 1928 proposes to make use of just these properties for preventive purposes.

Menthone in Oil of Calamintha Macrostema

In the work reported by A. Manjarrez and J. Iriarte (*Bol. inst. quim. univ. nacl. anton. Mex.* 4:79, 1952 through *Chem. Abstr.* 47:9572, 1953), *l*-menthone was isolated from the essential oil of a Mexican plant, *Calamintha macrostema*, in 65 per cent yield by distillation. The *l*-menthone was identified by physical constants, preparation of the oxine, semicarbazone, and 2,4-dinitrophenylhydrazone and by infrared analysis. The *l*-menthone was reduced to menthol and characterized as the *para*-nitrobenzoate. The percentage of *l*-menthone in the plant was determined both by isolation and by formation and isolation of its oxime.

Oil of German Citrus Trifoliata

In a study of essential oil of *Citrus trifoliata* from Germany, R. Lutz (*Ather, Ole, Reichstoffe, Parfumer, Essenz. u. Aromen* 2:105, 1952) found that two kilograms of the fresh fruit of this plant gave, after eight hours of steam distillation, 0.223 per cent of an oil with an odor similar to that of neroli. The oil had a specific gravity of 0.829 and an index of refraction ranging from 1.463 to 1.470.

Chromatography for Essential Oil Studies

In a paper presented at the December 10, 1953, meeting of the Society of Cosmetic Chemists, A. Post stated that with the observation by Tswett in 1904 on the separation of plant pigments on a column containing powdered chalk, the analytical tool, chromatography, grew by leaps and bounds. Its use by every branch of science from physics to medicine has given the scientist an insight into problems that had hitherto demanded a great deal of tedious labor or had been deemed unsolvable. Chromatography is an adaptable analytical tool in that there is no end to the possible modifications of the procedure. The large number of different adsorbents and solvent systems being used at the present lends credence to this fact. Filter paper is being used with advantage as the supporting medium leading to procedures of quantitative and qualitative analyses that require comparatively minute amounts of samples, inex-

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pensive equipment and, of greatest importance, a short period of time. This analytical tool, says Post, has been put to use in the essential oil and cosmetic industries, where it has helped to identify numerous constituents of oils, determined qualitative adulteration of products, and has been utilized in the preparation of interesting fractions of essential oils and in the identification of components of cosmetic products. However, from a consideration of the available literature, Post feels that chromatography has not been fully utilized by these two industries in comparison to the uses found in other sectors of the chemical field.

Essential Oils and the Skin

It is pointed out in the *Perfumery and Essential Oil Record* (44:331, 1953) that most of the essential oils will irritate the skin if allowed to remain on the skin in high concentrations over a period of time. Some workers develop only a mild dermatitis and are able to continue working and finally become immune. In others the dermatitis is so severe that they have to stop working. The person who suffers a severe attack does not, as a rule, develop an immunity, but seems to acquire a sensitivity which will cause his skin to react to many substances which he could formerly handle with impunity. He may even become hypersensitive to many ordinary materials used in his daily life and as a result suffer from a chronic eczema. Quite a number of cases of dermatitis have been reported of workers who manufacture perfumes, especially among those who express oils and also those who are engaged in blending and bottling the product.

Experimental and clinical experience have shown that the essential oil of bergamot is one of the chief agents in the development of perfume dermatitis. The nature of the photo-sensitizing agent in bergamot oil is not known as yet, but it is clearly indicated that continual contact develops a marked sensitivity on the skin. The problem of protecting or reinforcing the skin against the irritating effects of essential oils is complicated by the complex composition of the oils themselves which contain alcohols, terpenes, aldehydes, esters, ketones, phenols, acids, anhydrides, nitrogenous substances and hydrocarbons.

To prevent these oils from penetrating the "horny layer" of the skin and the sensitive areas beneath, the first requirement is a protective cream. This barrier must be so formulated that it is accepted readily by the skin, penetrating down into the dermis, forming a line of defence for periods of up to four hours, duration. This cream must not affect the products handled, and should protect the product against possible contamination due to perspiration from the hands of the worker.

Oil of Haplopappus

As part of a study of various essential oil plants of southern Arizona, some of the principal terpene constituents in the volatile oil of *Haplopappus laricifolius*, Gray were determined by W. F. McCaughey and T. F. Buehrer (*J. Am. Chem. Soc.* 75:4851, 1953). The oil was obtained by steam distillation of the leaves and small stems of the plant, a resinous, perennial shrub found at 3000 to 6000 feet elevation. The yellow oil comprised about 0.6 per cent of the fresh weight of plant material and had the following constants:

Specific gravity	**0.8631**
Index of refraction	**1.4842**
Specific rotation	**—14.06°**
Acid number	**3.7**
Ester number	**7.8**
after acetylation	**40**

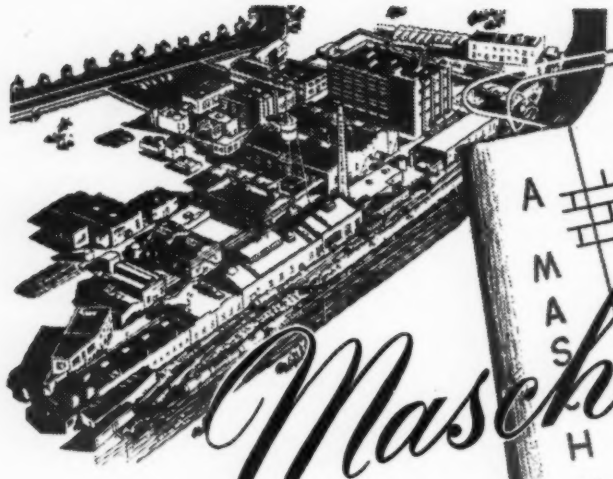
The oil was fractionated *in vacuo* into 29 fractions; and by means of their physical constants and crystalline derivatives, certain fractions were shown to contain *dl*-α-pinene, *l*-β-phellandrene, and *l*-phellandral, making up, respectively, 20, 30 and about one per cent of the whole oil.

Aromatic Acids in Perfumery

In another of his discussions on the essentials of perfume compounding, C. Morel (*Soap, Perf. & Cosmetics* 26: 809, 1953) provides considerable data on the aromatic acids. He points out that very few of these compounds find perfumery acceptance in their "own right," their chief function being as progenitors of the esters, aldehydes, ketones, ethers and acetals. For example, a consideration of the unsaturated acids is of importance because from them emerges a pattern which enables one to perceive the function of free and esterified acids in the build-up of a number of fixed and essential oils.

As in previous discussions, Morel presents considerable data in tabulated form concerning the compounds under considerations. This is also done in the adjacent table which summarizes much information on the characteristics of the aromatic acids.

Acid	*Mol. Wt.*	*M.P.*	*B.P.*	*S.G.*	*Basic Odor*
Benzoic					
Phenylformic	122	112	250	1.265	Faintly balsamic
Phenylacetic					
alpha-Toluic	136	76	266	1.080	Honey-neroli slightly indoloid
Anthranilic					
o-aminobenzoic	137	145	220	1.510	Faint balsamic-naphthol
Salicylic					
o-Hydroxybenzoic	138	160	280	1.435	Faintly phenolic
Atropic			dec.		
alpha-phenylacrylic	148	106	267	—	Odorless
Cinnamic					
beta-phenylacrylic	148	135	300	1.285	Faintly balsamic
Hydrocinnamic					
beta-phenylpropionic					
Dimethyl benzoic					
Benzylacetic	150	48	280	1.070	Mild hyacinth
Hydratropic					
alpha-phenylpropionic	150	—	265	1.065	Mild narcissus
Anisic					
p-methoxybenzoic	152	184	280	1.385	Faint sweet anise
Mandelic					
Phenylglycollic *alpha*-hydroxy-phenylacetic	152	118	dec.	1.360	Faint spicy aromatic
Pyrocatechuic (anhyd.)					
3 : 4-dihydroxy-benzoic	154	200	—	1.540	Faint musty-phenolic
Cuminic					
p-isopropyl-benzoic	164	116	sub.	1.160	Faint cumin oil
Coumaric					
o-hydroxy-cinnamic	164	208	dec.	—	Faint coumarin
Eugenic					
Caryophyllic	164	10	253	1.065	Spicy clove oil
Piperonylic					
3, 4-methylene-diozybenzoic "heliotropic"	166	227	—	—	Faint heliotrope
Vanillic					
3-methoxy-4-hydroxy-benzoic	168	207	sub.	—	Practically odorless
Veratric (anhyd.)					
Methyl-vanillic					
3, 4-dimethoxy-benzoic					
Dimethyl-proto-catechuic	182	180	sub.	—	Odorless



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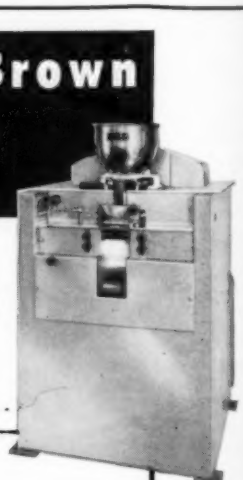

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Patent Thoughts and Trends

*by Thomas Cifelli, Jr.**
PATENT ATTORNEY

"COLD" WAVE PATENT FOUND INVALID BY SPECIAL MASTER

Background

On December 4, 1951, Dr. E. G. McDonough obtained U. S. Patent 2,557,710 broadly covering permanent waving compositions containing mercaptans (e.g., thioglycolic acid). The patent application had been subjected to very hard sledding in the Patent Office over a period of 10½ years.

On the very day that the patent was issued, a rash of suits broke out. However, as a result of preliminary skirmishes the real battle lines were drawn in New York. Helene Curtis and Gillette asked the New York courts to hold the McDonough patent invalid and not infringed. They attacked the patent on almost every ground known to the patent law. The beneficial owners of the patent, Sales Affiliates, not only denied all of the allegations of Helene Curtis and Gillette, but threw in a few legal punches of its own. Because the issues were considered by Judge Kaufman to be intricate, of considerable economic consequence, and a decision was pressingly urgent, he referred the case to a Special Master to hear the issues and report thereon with his findings of fact and conclusions of law. Accordingly, former federal Judge S. Rifkind was duly appointed as Special Master.

Special Master s Report

After presiding over the taking of depositions which took over two months, filling more than 2000 pages, and the subsequent trial, which took about 3 months and during which more than 20 witnesses gave more than 4000 pages of testimony and a thousand exhibits were involved, and after reading the briefs of the parties, which totaled almost a thousand pages, the Special Master made his report.

In a nutshell, the report finds that while there was infringement shown, the patent claims are invalid.

Limitations and Significance of Report

It should be emphasized that the report is NOT the decision of the court. It is still up to Judge Kaufman to make his decision.

Also, it should be noted that even if Judge Kaufman adopts the report, an appeal to the Circuit Court of Appeals is open to Sales Affiliates, and, furthermore, the possibility exists that suits under the patent are theoretically possible in other federal jurisdictions.

The writer naturally has some opinions on the matter but feels that it would be improper to make any comments at this stage.

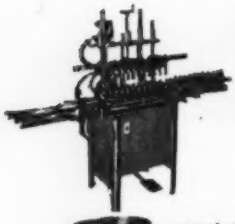
The report constitutes a treasure-house of technical information on the permanent waving art and in the writer's opinion is the most complete work open to the public on the subject. Since it comprises about 130 printed pages, plus an appendix which includes several charts, it is obviously impossible to do more here than to draw on some of its highlights. In the interests of accuracy, the actual language of the Special Master will be used. It is believed that the meaning will be clear, it being remembered that since the suit was brought by Curtis and Gillette attacking the patent, they are in the position of plaintiff and Sales Affiliates is in the position of defendant. There were some other parties but we need not concern ourselves with them.

Permanent Waving Art

The art of permanent waving since its inception has revolved around the physical phenomenon that the hair of the human head, normally hard and resistant to changes in form, can be made soft or plastic and, while in that state, molded to any desired form or shape. Human hair—like all animal fibers—contains an abundance of an organic protein substance called "keratin." In each hair fiber keratin is found in the form of long polypeptide chains, joined transversely by numerous cross-linkages called "disulfide bonds or linkages." The latter, which consist of two sulfur atoms joined to each other and on each side to the main chains, are responsible for the mechanical stability of the keratin structure. The softening of the hair, which is necessary in all permanent waving, occurs when these cross-linkages are ruptured.

The basic steps involved in the permanent waving process have undergone very little change since the early days: The hair is placed under differential strain by winding it on a curling rod or mandrel, a softening agent is applied (either before or after the winding), and finally the hair is treated to remove the softening agent and set the wave. The last step is simply the process of returning the hair to its normal hard state so that it will retain the curl and shape it has acquired while in the softened state. The lotion or softening agent may be applied in any number of ways. Thus, it can be applied directly by daubing with a swab or brush, or the lotion can be circulated through the hair by means of tubes attached to the curlers.

Essentially, the development of the art has been a search for a method or a waving agent which will render the hair plastic, and hence amenable to a change in form, with the least amount of danger, inconvenience and expense to the patron. Until the middle 1930s, all commercial permanent waving methods utilized softening solutions containing alkaline agents such as borax, ammonia or ammonia salts. These alkaline agents cause a rupturing of the disulfide cross-linkages—and make the hair plastic—by a reaction known as hydrolysis, in which one hydrogen atom combines with the sulfur atom of one part of the link, and one hydrogen and one oxygen atom combine with the other sulfur atom. But the reaction requires a



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great deal of heat—of extremely high temperatures—to aid the softening and effect the setting of the hair. The heat source was usually an expensive, bulky machine, both dangerous and inconvenient to the patron, and permanent waving of this period was confined to beauty parlors. By about 1932, however, the "machineless" method, in which heat is supplied by individual exothermic chemical pads attached to the curls, came into general use. While the machineless method constituted a significant advance, the art continued to feel its way toward a waving method which would dispense with the need of any heat whatsoever and could wave at room temperatures.

The first cold waving solutions, which incidentally were sold for home use, appeared in 1934. These were alkaline, inorganic sulfite solutions and met with little commercial success because of the extremely long waving time required. Inorganic sulfites are reducing agents which are capable of splitting the disulfide linkages in keratin by direct reduction, i.e., by supplying a hydrogen atom to one of the sulfurs, and either a hydrogen atom or some other group to the other sulfur atom. The cold waving method dispenses with the heat source but utilizes a "neutralizing" solution containing an oxidizing agent which, when applied to the hair, reverses the reducing action of the waving agent by rebuilding the disulfide linkages, thus returning the hair to its normal hard state.

Subsequently, ammonium hydrogen sulfide, also an inorganic reducing agent, was substituted for the sulfites and shortened the waving time considerably; but sulfides proved unfeasible for home use because of the insurmountable odor problem created by the release of hydrogen sulfide gas from the solution. By 1940, ammonium hydrogen sulfide solutions were being used in beauty parlors on a nation-wide basis in a closed, circulating system, known as the Willat method after its inventor, Arnold F. Willat. This system, while capable of producing commercially acceptable waves at room temperatures, required the use of a costly machine to circulate the lotion and also needed extensive ventilating equipment to remove any noxious odors which escaped. Nevertheless, despite these disadvantages, the Willat system met with increasing commercial success until April, 1941, when the death of a beauty shop customer was attributed to hydrogen sulfide poisoning incurred while receiving a Willat cold wave. The Federal Food and Drug Administration confiscated all ammonium hydrogen sulfide solutions and precluded their further use.

Also in 1940, a second cold wave method, known commercially as the "Turbanwav," made its appearance in the beauty parlors. Turbanwav, like the earliest home waving methods, employed alkaline sulfite solutions. However, because of the slow waving action, the customer was required to make two trips to the beauty parlor on separate days and to wear a turban about her head in the interval. This apparently was too high a price to pay for beauty, and the Turbanwav made little progress.

Such, in brief summary, were the methods and the waving agents employed in the art prior to the commercial appearance of mercaptan cold waving solutions in about July, 1941. Mercaptans essentially are derivatives of hydrogen sulfide, one hydrogen atom being replaced by an organic group. Like the inorganic sulfites and sulfides, mercaptans are effective as waving agents because of their ability to reduce the disulfide linkages in the keratin structure of the hair. Initially, mercaptan lotions were used as a substitute for ammonium hydrogen sulfide in the Willat circulating system. But it was not long before the circulating system—undoubtedly because of its high installation costs and the wartime shortage of materials—was almost entirely displaced by the direct application system in which the lotion is applied by means of a brush or swab directly to the hair. As soon as commercial acceptance of mercaptan waving lotions was established, the home permanent waving industry came into being. By 1944 one manufacturer alone (The Toni Company) claimed the sale of 67 million home permanent waving kits and permanent waving lotions had become a mass market commodity. Today the industry has grown to a point where nearly 100 million permanent waves (using mercaptan waving lotions) are given each year in the homes and in the beauty shops of this country. Certainly, the size of the industry accounts in no small measure for the shrillness of the present contest; the annual business volume of the industry is in the hundreds of millions of dollars.

The McDonough Patent

Because of space limitations here and the fact that the teachings of this patent were gone into extensively in a previous article (Jan., 1952) only claim 1 will be reproduced here. Also, in this connection, a copy of the entire patent can be obtained for 25 cents from the Commissioner of Patents, Washington, D. C.

Claim 1 follows:

> A permanent waving composition comprising a mercaptan having a molecular weight less than 121 and having the general formula R-SH, where the organic group R contains a carbon atom attached to the sulfur atom, said mercaptan having a vapor-pressure-depressing substituent in the organic group R, in a solution containing an alkaline material having a dissociation constant less than 5×10^{-3}, said solution having a pH higher than pH 7 and not higher than pH 9.5, the concentration of said mercaptan in terms of weight per volume ranging between about 1% and about 10%, the concentration of mercaptan and the pH of the solution being adjusted within said ranges to obtain a permanent change in the configuration of human hair during a given time of application without damage to the hair structure by having the concentration of mercaptan in the higher portion of said concentration range for a lower pH and having the concentration of mercaptan in the lower portion of said concentration range for a higher pH within the stated pH range.

The Claimed Invention

The main issue apparently was whether the conditions such as pH, molecular weight, concentration and kind of base were in fact critical and, if they were critical whether McDonough disclosed in his application that any of these factors were critical.

The report reviews the evidence on these points and concludes against the patent on all of these points.

The Prior Art

The report noted that the prior art references relied upon to attack the patent fall into four categories: (1) patents and publications disclosing reducing agents and mercaptans as permanent waving agents; (2) patents and publications which disclose and describe the use of mercaptans as depilatories; (3) a single publication in the field of colorimetric analysis describing a mercaptoacetic acid—ammonium hydroxide composition; and (4) prior public uses by contemporaneous workers in the per-

(Continued on page 290)

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Abreast Of The Markets

Markets Appear More Normal; Pattison Reports on Glycerine, Reis Talks on Essential Oils

Renewed interest was displayed in the markets last month, following the inventory periods customary at this time. In the essential oil field, conditions are about back to normal, as reported in the January *D&O News:* "The essential oil market for the past year, while still reflecting to some extent the war situation, has pretty generally returned to a fairly normal footing, which means that price and supply are both indicative of either natural conditions or regular market activities."

There are still some irregularities in the essential oil market, as the report points out—such as the dire shortage of the Chinese oils of cassia and anise, and the firm price of Italian bergamot oil. Italian lemon oil is also on the firm side because of an unusually large purchasing program on the part of European countries which is greater than ever before.

On the botanical side of the picture, there is also a sign of increased activity. A few items of extreme interest include agar agar, in which the domestic supply has been reduced to almost nothing; papain, which has been enjoying favorable prices but may soon display an abrupt reversal; and Chinese rhubarb root, which is very difficult to obtain on the spot market.

The general consensus in the trade at the present time is that these markets will become increasingly active as the year progresses and the new crops appear.

Report on Glycerine

E. Scott Pattison, manager of the glycerine division of the Association of American Soap & Glycerine Producers, reported during the Association's annual convention last month that the present glycerine supply will probably be able to satisfy all demands in the United States during 1954. He stated that the 1953 domestic output of crude and synthetic glycerine will probably amount to about 218,000,000 pounds, or about 30,000,000 pounds above that in 1952, and emphasized the fact that this increase occurred even though soap production had fallen off.

Mr. Pattison attributed this last development to three factors—the use of better-grade fats in soap making and a proportionate increase in glycerine yields; greater production of glycerine as a co-product of fatty acids and fatty alcohols; and the increased production of synthetic glycerine.

Alcohol Unchanged

Industrial alcohol continued to be in heavy demand last month, with supplies more than enough to cover all needs. Owing to the recent increase in synthetic alcohol production, the entire alcohol picture is changing, and it appears at the present time as though production will have little difficulty in keeping up with consumers' demands under normal circumstances.

Quicksilver Higher

Demand for quicksilver was slow last month. Much of the domestic material was being taken up directly by consumers. European sources have been quoting the metal at $192 a flask, duty paid, but very little has been entering this country.

Reis Discusses Essential Oils

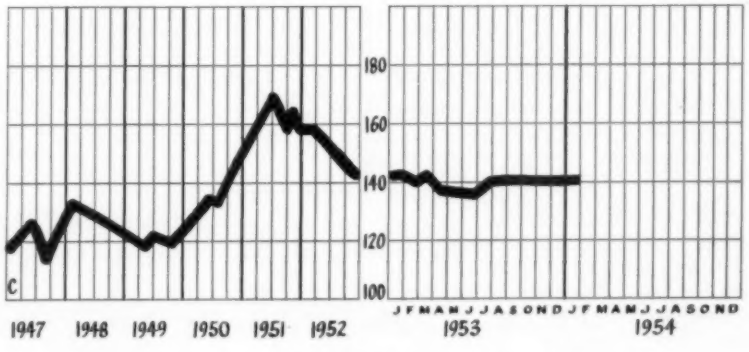
Waldo Reis, retiring president of the Essential Oil Association of the U. S. A., predicted a firmer price trend for this year in essential oils and aromatic chemicals in a talk before the organization's 26th annual meeting in early January. He stated that prices for many important essential oils were quite stable during last year and that current prices are generally on the low side. He went on to say that during such a period of stability when prices are at such a level, demand for essential oils is much greater.

Cocoa Butter Down

Cocoa butter dropped 18 cents a pound in January and is now being quoted at $1.10. Reason for the decline was said to have been a parallel decline in cocoa bean quotations, added to a certain amount of consumer resistance to the higher figures. Whether or not this will prove to be a momentary de-

(Continued on page 270)

25 Cosmetic Raw Materials—Unweighted Price Index. 1926=100.



The cosmetic raw materials index advanced from 140.6 to 141.2. Balsam tolu was higher.

Prices quoted in this section were current on the first of this month.

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Caffeine Reduced 15 cents; Chlorophyll, Papain, Lower; Synthetic Menthol Expected to Advance; Rhubarb Scarce

Caffeine alkaloid went down 15 cents last month as the result of competition from lower-priced imported material. Hydrous caffeine was set at $2.65 a pound, and anhydrous material, at $2.85.

Chlorophyl Reduced

The American Chlorophyll division of Strong, Cobb & Co. early this month announced a price reduction in water-soluble chlorophyll from $60 to $45 a pound. The grade affected is the W.C.M. sodium potassium copper chlorophyllin on a 100 per cent basis. The price drop was brought about, the company said, because of new improvements in production methods.

Papain Lower at the Moment

While the price of papain dropped down to $4 a pound (from the previous figure of $5.50) last month, the general feeling in the trade is that such an attractive price level will be only momentary. A sharp reversal in this market is expected in the immediate future.

In many cases, producers of papain have turned to other, more remunerative crops, which means that a shortage will probably be felt in this botanical as soon as supplies in the United States have been used up and replacements are sought.

Glycerine on Quiet Side

Refined glycerine is on the sluggish side at the present time, as is to be expected during this time of the year; however, crude glycerine continued to advance in price, apparently as a result of a tight supply position. Concensus in the trade is that refined prices will stay as they are at 33½ cents a pound.

Menthol Unchanged

Prices of Brazilian menthol were being quoted in the vicinity of $5 a pound last month, in some quarters. Authorities indicated a possibility of an increase, even though the current demand is sluggish. There were reports of higher quotations coming out of Brazil. At the same time, very little Japanese material was available, and this was being quoted from $8 up to $10 a pound.

Vanilla Remains Firm

The vanilla bean market continued to be very firm last month, with hardly any offerings from Mexico or Tahiti. Reports indicated that the primary markets were holding back on shipments to await higher market prices.

Bourbon beans were selling in the range between $6.75 and $7.25, Mexican cuts, from $6.75 to $7, Mexican whole, from $7 to $7.50, and Tahiti beans, from $5.50 to $5.75 a pound.

Synthetic Menthol Prospects

There may be some upward revisions in the price of synthetic menthol in the near future, owing to the fact that manufacturers are said to be coming to the end of their stocks of lower-priced citronella oil. When they replace this essential oil with higher-priced material, it may be necessary for them to pass the price difference on to the synthetic menthol, which is now selling in the range between $5 and $5.25.

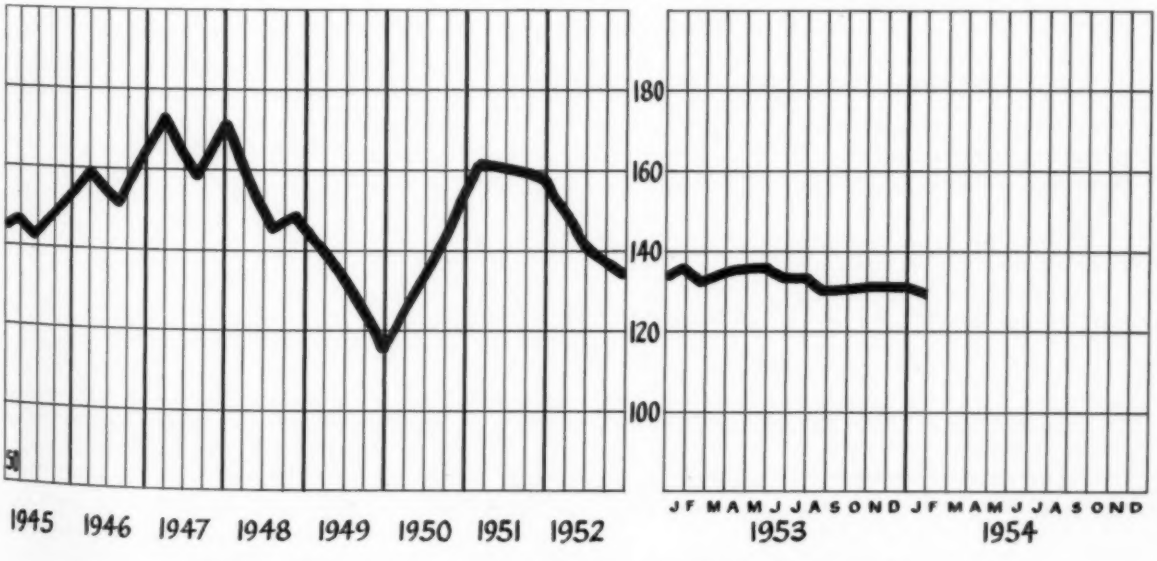
Anethol Demand Continues

Anethol prices remained at $1.25 a pound last month, as the demand continued on a very active level. The shortage of anise oil, as previously reported, has contributed greatly to the expanding anethol market.

Rhubarb Root Very Scarce

As might be expected, Chinese rhubarb root is just about impossible to obtain in the spot market at the present

50 Raw Materials—Weighted Price Index. 1926=100.



The price index of fifty commodities for January declined from 130.1 to 128.1.

JANUARY PRICE CHANGES

UP

Agar Agar, No. 1 50c
Balsam Tolu 25c
Benzoin Gum, Siam 25c
Lemongrass Oil 25c
Quicksilver $5
Sarsaparilla Root, Mexican 10c
Sassafras Oil, Artificial 20c

DOWN

Caffeine, Alkaloid 15c
Cananga Oil, Rectified $325
Clove Oil $2.15
Geranium Oil, African $2
Papain $1.50
Pimento Berry Oil 20c
Saffron Valencia $2
Sage Oil 90c
Wormseed Oil 75

time, owing to the absolute lack of replacements from that country. The price remained between 90 cents and $1 last month; however, as time goes on, the market is expected to become even firmer and may reflect higher prices.

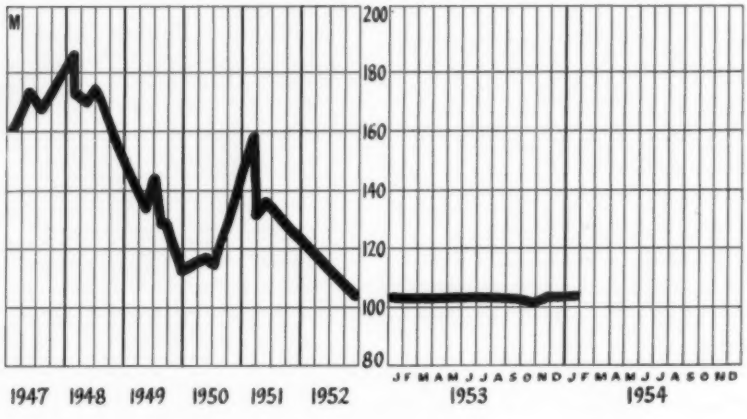
Sarsaparilla Root Tight

There is very little Mexican sarsaparilla root available at the present time, according to dealers, and consequently the 35-cent price which is being quoted is largely nominal.

Agar Very Firm

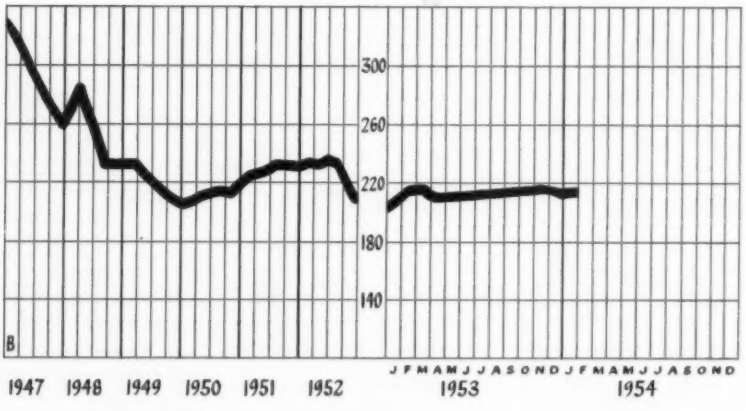
Because spot stocks of agar agar have been reduced to almost nothing, prices of this item went up to $3 last month, with the upper end of the range extending to $3.25. New-crop material will probably be available in this country during March and April, at which time the agar market is expected to level off. At the present time, however, producers at the origin are thinking in terms of higher shipping prices.

15 Medicinal Chemicals—Weighted Price Index. 1926=100.



The medicinal chemicals index went up slightly from 104.1 to 104.2. Quicksilver was higher.

15 Botanicals—Weighted Price Index. 1926=100.



The botanicals index went up from 212.9 to 213.8. Agar agar, balsam tolu and quicksilver were higher.

Cocoa Butter Down

(Continued from page 267)

cline in the cocoa bean market remains to be seen, since this time of the year is ordinarily a busy period for this commodity. Renewed interest in cocoa butter could reverse the trend very quickly.

Quince Seed Firm

During the first week in this month spot stocks of quince seed were at a very low level. Relief was expected in a short time, however from new shipments. It is not known at this time how permanent this relief will be, for there are many orders to be filled from the new crop material.

Benzoin Gum Higher

Owing to an increased demand for Siam benzoin gum over the past few months, the spot market has become largely depleted. Where there were ample stocks to take care of consumers' needs previously, there are hardly any supplies left at all right now. Prices on the spot market have advanced to $3.25 a pound, and sources at the origin are said to have even firmer ideas in regard to replacements.

Balsam Tolu Reversal

Higher replacement costs, coupled with a much greater demand in this country, prices on balsam tolu went up in January to the range between $3.25 and $3.50 a pound. Spokesmen in the industry are of the opinion that this item will continue to rise in price and look for a much firmer market in the very near future.

Spearmint Oil Active

Consumers have been buying sizable amounts of spearmint oil in recent months, but there has been no firming of the oil, principally because of the very favorable production during 1953. The price extends between $5.85 and $6.50 at the present time, and most dealers believe it will remain close to that for some time to come.

Peppermint Oil Very Firm

Demand for peppermint oil has become extremely active in the past few months producing quite a tight market. The main reason for the firm nature of the oil is that consumers have been demanding large quantities of high-test material to be used for blending. There is a very limited supply of this high-grade oil. Prices of the natural oil extend from $6 to $6.15, and of the redistilled material, from $6.50 to $6.75 a pound.

Grapefruit Oil Continues Firm

The range of prices in grapefruit oil, which extends from $3 to $3.50 a pound, is expected to remain unchanged until the new-crop oil arrives in May or June. If anything, the market will become firmer than it already is, until that expected relief comes.

Orange Oil Steady

Orange oil prices remained the same during January, with the American cold pressed extending from 90 cents to $1.75; American distilled, from 80 cents to $1.25; West Indian, from $2.25 to $3; and Italian, from $3.25 to $6.50. There was more than enough material on the spot market to handle all requirements without difficulty.

Lemon Oil Firm

Lemon oil continued very much on the firm side last month, as demand for the item still far outstripped the production. Domestic lemon oil was selling at prices ranging from $7.25 to $7.65, while the Messina oil continued to be quoted from $6.50 to $10 a pound. There are no immediate prospects of any relief from the firmness which this market has felt for some time.

Bergamot Oil Holds Firm

There were no price changes in bergamot oil last month; however a definite firmness continued to be felt. Consumers have bought up considerable quantities of the oil in recent months, and replacements from Italy have been on the limited side. Spot stocks, therefore, are less plentiful than previously.

Geranium Oil Firm

Bourbon geranium oil is reported to have become firmer, although no recent price increases have occurred. The firmness has developed, according to spokesmen, because the August cutting was less than had been anticipated. These sources also indicate that an additional harvest in January and during this month is expected to ease the entire geranium market.

The African oil was quoted last month between $10 and $11, and the Bourbon, from $12 to $13.50.

Firmness in Citronella Oil

The spot market in citronella oil has become firmer during the past few months and, from all indications will continue in that direction for some time to come. Replacement costs for the Formosan oil were said to be higher and will have a strengthening effect on the spot market where stocks are limited.

Citronellal May Advance

Various sources expect citronellal to advance in price in a short time as a result of recent increases in citronella oil. The same situation exists in citronellol which at the present time is being quoted at $2 a pound.

Citronella Oil Production

The goal for production of citronella oil in Formosa in 1954, according to Foreign Commerce Weekly, is 1,100 metric tons (1 metric ton = 2204.6 pounds). Those figures for 1953 are not available, while the production in 1952, previously estimated at 1,200 tons, was given as 714 metric tons.

An official U. S. report from Formosa gives the production of citronella oil since 1940 as follows:

Year	*Tons*	*Year*	*Tons*	*Year*	*Tons*
1940	273	1944	35	1948	213
1941	174	1945	29	1949	380
1942	319	1946	12	1950	762
1943	201	1947	61	1951	1,274

Lemongrass Oil Higher

Owing to higher replacement costs from the origin, the spot price of lemongrass oil advanced 25 cents last month to the range between $1.45 and $1.65.

In some quarters it was said that the oil prices would very soon level off and perhaps even decline slightly. It remains to be seen.

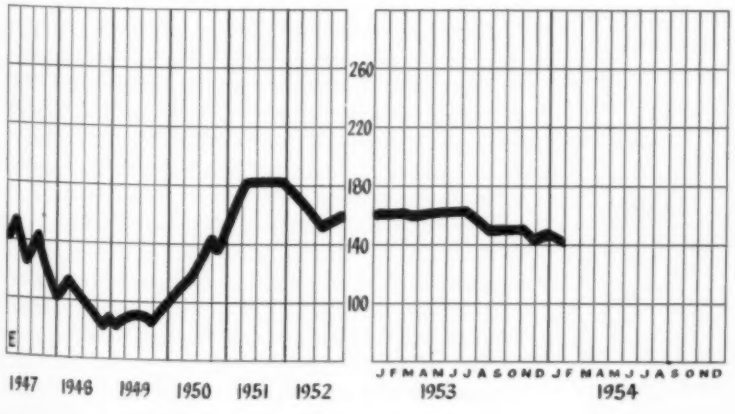
Eucalyptus Oil Active

Interest in eucalyptus oil picked up in January, with the beginning of full-fledged buying season. Since there are ample stocks on spot at the present time, no price changes have occurred. Dealers indicate that this oil should remain quite stable pricewise during the next few months.

Petitgrain Oil on Firm Side

Shipments of petitgrain oil from the origin have been decreasing in recent months, with the result that the spot market has become firmer. In some quarters an increase in price is looked for in the near future.

15 Essential Oils—Weighted Price Index. 1926=100



The essential oils index declined from 146.3 to 140.9. Clove oil was lower.

ULTRASONICS

(*Continued from page 193*)

sonic generator. It is felt that until such equipment is provided, many applications for ultrasonic energy must remain in the minds of the engineers.

Nonetheless a great deal has been accomplished through the use of the tremendous forces that are developed during the propagation of ultrasonic waves by the equipment now available. Ultrasonics has proved of value in a number of industrial processes such as extraction, homogenization and emulsification, precipitation of solids from liquids, gauging liquid levels, detecting flaws, measuring and controlling viscosity, catalyzing chemical reactions, cleaning metal parts, inspecting pipelines for internal corrosion, and collecting solids from fumes either to recover valuable materials or to prevent air pollution. In addition, these waves are used in industrial chemistry to improve crystallization, coagulation, oxidation, polymerization and other reactions.[9,11,13]

Ultrasonics has been especially valuable in the development of improved testing equipment and laboratory instruments. Among devices that might be mentioned is a recently patented[14] ultrasonic thickness gauge, ultrasonic reflectoscopes that permit the use of new technics for making rapid, accurate and nondestructive tests,[15] various instruments for checking flaws and bonds,[9,16] and improved, highly sensitive ultrasonic photometers.[17]

Rather illustrative of the value of ultrasonics in instrumentation is the device developed by Roth and Rich[18] for continuously and automatically measuring viscosity. Called the Ultra-Viscoson, this instrument not only offers instantaneous readings, but also provides a type of equipment that is basically simple and compact and has no moving or wearing parts. Adapted to the determination of blood viscosities, this instrument has also become a valuable tool in medical research.[19]

As noted in Weissler's[10] review on sonochemistry, among the reported chemical effects of intense ultrasound are reactions of hydrolysis, addition, oxidation, polymerization, depolymerization, and molecular rearrangement. As is now well known, ultrasonic energy is capable of initiating and accelerating oxidative processes.[5,11] As a depolymerizing agent, ultrasonic force can cause the breaking up of long-chain polymers such as starch, gelatin, gum arabic, polystyrene, polyvinyl acetate, nitrocellulose, proteins and rubber. Ultrasonic depolymerization has made possible some interesting research with important theoretical implications concerning intermolecular and even intramolecular forces.[1]

Although the application of ultrasonics to chemistry is not yet fully developed, it is recognized[9] that many chemicals could be processed ultrasonically, even with present-day equipment if they could be converted from batch-type to continuous-flow treatment. Thus, with materials flowing through pipelines, it would be necessary to treat only a relatively small volume at any one instant; such treatment being well within the range of equipment now available.

In the pharmaceutical field, ultrasonic treatment helps in the separation and recovery of certain products.[12] An interesting example of such utility is provided in Shropshire's[20] process for extracting fish oils. In his procedure, coarsely ground fish fragments are subjected to a high-power compressional wave vibration which produces cavitation within the mass and releases the oil that is recovered by the usual means. It is claimed that fish liver oils of high vitamin potency, as well as superior color, taste and stability are prepared by this method. It has also been shown[21] that gelatin may be extracted from raw materials at an accelerated rate when the raw hides and bones are irradiated with ultrasound.

People in the drug and cosmetic industries are particularly interested in the potentialities of ultrasonics in emulsification, homogenization, and dispersion. Williams,[11] for example, cites reports on the application of ultrasonic emulsification in the perfume industry. The resulting emulsions are said to avoid its use of organic solvents that may be harmful to the skin.

Also indicative are the investigations made by Templeton[7] to determine the value of ultrasonic vibrations in dermatology. In one experiment, he treated five per cent of precipitated sulfur in distilled water with 800 kilocycle ultrasonic waves for five minutes. This yielded a clear solution which remained stable. In another experiment, five per cent of ammoniated mercury in distilled water was treated in the same way, with similar results.

From these and other studies, Templeton concluded that the factor of frequency is an important consideration in making such preparations. This is in line with the observations of Audouin and Levavasseur[22] during their experiments on the emulsification of vegetable oils by ultrasonic waves. They found that the frequency determines the direction of the emulsion, regardless of the emulsifying agent. Some frequencies, they reported, tend to break the emulsions. They also found that emulsification is favored by low temperature and the presence of an emulsifying agent.

Among the problems now being attacked with ultrasonics is the important problem of fat emulsification for intravenous feeding.[21] Ultrasonics also makes possible the production of finer and more uniform colloidal suspensions, especially of the antibiotics.[12] This, of course, makes such drugs more suitable for administration by injection.

The practical application of ultrasonics to emulsification has been furthered by the recent introduction of an industrial ultrasonic homogenizer. In discussing this machine, which is known as the Rapisonic, Chilson[23] observes that the efficiency of the equipment depends on the development of high-energy concentrations through cavitation; local pressures of the order of 30,000 pounds per square inch being built up. He notes that although there is some doubt as to what actually causes the dispersion, it is certain that cavitation plays

the main role and that other effects are secondary.

The manufacturers of this emulsifying equipment claim that particle sizes as small as one micron are possible. Hence the resulting emulsions tend to be highly stable, and in many cases less emulsifier is needed. The apparatus is easy to maintain and may be dismantled quickly for cleaning.[24]

Other ultrasonic effects are also of interest to pharmaceutical and cosmetic manufacturers. According to Williams,[11] the vibratory effects of ultrasonics may be utilized to assist the passage of powders that tend to clog. By shocking the material out of its metastable condition, an ultrasonic wave imparts free-flowing properties to the powder. In crystallization processes, ultrasonic irradiation offers a means for inducing large crystal growth. By this means, the point of initiation of crystallization may be controlled as required, while the number of primary centers of crystallization may be increased. Since expulsion of dissolved gases in a liquid occurs with ultrasonics, its degassing action is also worthy of mention.[1]

Much valuable data have been assembled on the cellular effects of ultrasonic energy. Thus, it has been found that yeast cells lose their reproductive ability when exposed to ultrasonic waves, and luminous bacteria lose their luminosity. However, certain types of bacteria are not adversely affected but rather are stimulated to increased activity and virulence.[11-25]

In reviewing this phase of investigation, Ponzio[26] stated that systematic studies of the biological action of ultrasonic waves have shown that the mechanism of action is manifold and varies according to the organism. It is possible to cause direct changes in bacteria and other unicellular organisms merely by a definite increase in the wave frequency. In this connection, Ponzio cited studies in which complete destruction of cultures of bacilli was obtained. He also called attention to microscopic observations which revealed that the infusoria may be reduced to fragments by crushing with ultrasonic waves, and that analogous destruction can be observed in blood cells suspended in plasma.

Ponzio also reported that, following ultrasonic irradiation, effective vaccines were obtained from cultures of streptococcus and of typhus and pertusses organisms in which the immunizing power appeared superior to those of vaccines obtained by the usual methods. Of interest in this connection is a new pertusses vaccine, developed by Sharp and Dohme, which is prepared by subjecting the whooping cough organisms to high-frequency sound waves. Clinical tests by Felton[27] show the new material to be as effective as the standard type of vaccine but with fewer and less severe fever reactions.

The use of ultrasonics for the improved preparation of antibodies, immune sera and vaccines has been investigated by a number of workers. One pioneer has found that the separation of antibodies from pathogenic cells is hastened by ultrasonics. For instance, extracts from typhoid bacilli and hemolytic streptococci

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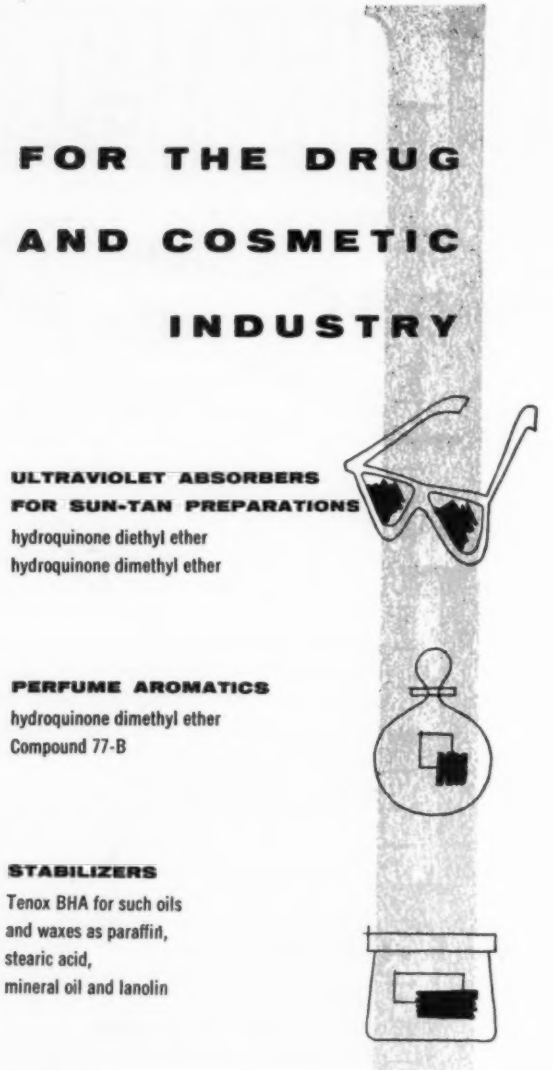

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can be made in this way. Other investigations have shown that ultrasonic waves are a satisfactory means of disintegrating bacteria or cells under completely aseptic conditions to release chemical substances such as endotoxins, enzymes, polysaccharides, and hemoglobin.[5,11,25] Following a consideration of the action of ultrasonic vibrations on proteins, viruses, and bacterial cells, Rouyer and his associates[28] came to the conclusion that the use of these waves is the best method for obtaining extracts of bacterial cells, since it results in the least chemical alteration.

Other workers[1,29,30] have studied the antibacterial effects of ultrasonics and some have looked into the potentialities of these waves as sterilizing agents. From such studies, it seems that whether or not the microorganisms are destroyed depends mainly on the intensity or the radiation and the media in which the organisms occur.[11]

In a study of the several factors that influence the efficacy of ultrasonics, Hamre[31] reported, among other findings, that a decrease in the amplitude of the waves resulted in a decrease in the mortality rate of *Klebsiella pneumoniae*. She also found that the organism responsible for feline pneumonitis was inactivated by ultrasonic energy. This force also inactivated influenza virus A. However, in none of Hamre's ultrasonic experiments was 100 per cent of the cells or virus destroyed. Similarly, in a recent discussion of cold sterilization technics, Guillot[32] stated that ultrasonic radiation does not produce 100 per cent sterilization because spores are hardly affected.

The work of Wood and Loomis[6] in 1927 led to the belief that ultrasonics might become a useful tool in physical therapy. However, it was not until 1939 that a suitable apparatus was devised to provide ultrasonic treatment. Since then ultrasonic therapy has found wide application in Europe, especially in Germany and Austria, but it is just beginning to find cautious acceptance in the United States. Conceding the difficulty of determining the value of this form of treatment, some American workers[33,34] are of the opinion that the majority of the foreign reports lack evidence of truly critical or scientific evaluation of ultrasonic therapy.

The attitude of American physiotherapists toward ultrasonic therapy has been well indicated in a report prepared by Krusen and his colleagues[35] for the Council on Physical Medicine and Rehabilitation of the A.M.A. On the basis of extensive studies, these workers stated that, "If ultrasonic energy is employed properly by skilled physicians and not used indiscriminately as a 'cure-all,' it offers promise of becoming a valuable new therapeutic and diagnostic agent."

Ultrasonic vibrations for therapeutic purposes are usually produced by the quartz piezoelectric crystal method. In the treatment units or transducers, the piezoelectric crystal with its electrodes is housed in a metal case with a diaphragm or transmission plate to provide coupling to the crystal.[36] Since air is such a poor transmitter of ultrasonic energy, it is necessary

to use a coupling agent to avoid an air space between the energy source or sound head and the part being treated. Mineral oil, glycerine, special ointments and other air-free materials are satisfactory substances for avoiding dry spots.[37]

Water coupling, obtained by immersing both the body and the transducer or through the use of special water couplers, is also satisfactory. According to Dallons[37] underwater "soundings," as the ultrasonic treatments are called, are recommended where contact with the skin is not practical because the parts are too uneven, as in the case of small joints in the feet and hands, or in instances where the parts are very sensitive to pressure.

Ultrasonic frequencies of 800,000 to 1,000,000 cycles per second (e.g. 800 to 1,000 kilocycles) are generally used for therapeutic purposes.[33-35-38] However, treatment must be individualized and the success of ultrasonic therapy depends on careful attention to details. According to Bauer,[39] effective technic depends upon the consideration of such factors as: (a) the choice of frequency, (b) the type of wave, (c) the intensity, (d) the type of sound head, (f) the duration, and (g) the number of treatments.

Much work has been done to determine the effects of ultrasonics on tissues.[6-26] However, the physiolologic effects of these vibrations are not well understood.[1] Many investigators, especially American workers,[33-40] are inclined to believe that the thermal effects are chiefly responsible for the therapeutic effects of ultrasonic radiation. Typical is the view expressed by Schwan and Carstensen.[36] "With our present knowledge," say these authorities, "we are led to the conclusion the effect of ultrasonic energy on tissue is primarily thermal. The value of ultrasound as a new tool of physical medicine, therefore, lies in its ability to develop heat inside the human body."

In citing the advantages of such therapy, they note that absorption of ultrasonic energy in muscle is about twice that in fat. This is an important advantage of ultrasonic heating over electromagnetic diathermy, where the maximal heat production occurs in fatty tissues. In addition, ultrasound also offers simultaneously a high depth of penetration and good beaming.

However, as remarked by Piersol,[33] there are some observers, both in this country and abroad, who insist that the clinical improvement seen after ultrasonic therapy cannot be explained solely on the basis of thermal effects. They maintain that mechanical, chemical and biological effects are equally important. Although, says Piersol, it is generally recognized that ultrasonic energy can produce these effects, it must be admitted that at present they are poorly understood, especially as to their influence on the human organism.

To a certain extent, therefore, ultrasonic therapy is still in the investigative stage. This is an important consideration with respect to the limitations of ultrasonics in treatment and to the dangers of this form of therapy. It is well known, for example, that high dos-

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ages and excessive exposure may cause considerable tissue damage.[8,35,41] In urging caution in the use of ultrasound, Newman and Murphy[42] warn that severe injury to tissue, bone, peripheral nerves, generative tissue, hair follicles and growing bone and tissue may occur with the application of high intensities.

However, as observed by Krusen and his coworkers,[8,35] from the therapeutic viewpoint it must be remembered that many potent therapeutic agents are dangerous in overdoses. They point out that, when no anesthesia is employed, pain will serve as a danger signal and prevent overheating of tissues. In proper doses, it is concluded, ultrasonic diathermy may well produce valuable selective heating effects not previously obtainable.

In capable hands and with modern equipment with well-controlled energy output it is possible to provide safe ultrasonic therapy. Friedland and his colleagues,[43] for example, gave 1,477 ultrasonic applications to 161 cases during one year with no significant detrimental effects. To further facilitate ultrasonic therapy and heighten its safety, standards are being developed for the units by the American Standards Association.[44]

In addition, the contraindications to ultrasonic therapy are quite well recognized. In general, the contraindications are for tissues rather than diseases.[45] According to Summer,[46] ultrasonics is strictly contraindicated in the treatment of parenchymatous organs such as the brain, heart, liver, spleen, kidneys and the like; of the pregnant uterus because of the danger of abortion; of malignant tumors; and of the great ganglia of the neck in cases of cardiac disease. Soundings of the gonads and growing bone are likewise contraindicated.[43]

The indications are still being developed. The European literature suggests that ultrasonic therapy is applicable to quite a long list of conditions. American workers, however, are more conservative. Thus, Piersol[33] states that the chief indications for its use are the arthritides and allied rheumatoid conditions, including myositis and fibrositis, and disorders of the peripheral nerves such as neuritis, especially that involving the sciatic nerve, neuralgia, causalgia, coccygodynia, and pain in phantom limbs.

In the experience of de Preux,[47] ultrasonic therapy is of little value in rheumatic disease of the inflammatory type, but it is of definite value in rheumatic disease of the degenerative type, notably osteoarthritis. Pertinent in this connection is the observation by Thewlis[48] that ultrasonic treatment is especially effective for osteoarthritis of the knees, hips and spine in the elderly.

Similarly, ultrasonic therapy rates high for the treatment of bursitis.[33,43,49,50] In some cases, this form of therapy has also been found to be of benefit in certain neurologic disorders; a recent report[51] citing its "almost specific action" on painful neuromas. Ultrasonic therapy likewise finds employment in treating various peripheral circulatory disorders[46] and may have place in the management of Buerger's disease.[52] In addition to its major indications, there is evidence that ultrasonic irradiation may be useful in the treatment of certain skin disorders,[7,33] various ear conditions,[53,54] and perhaps in the therapy of the eye.[55,56]

Using an echo technic and a selective transmission method, ultrasound has also shown considerable promise as a diagnostic aid.[35,41,45,57] For example, Ludwig and Struthers[58] have developed a method for locating gallstones and foreign bodies in tissue by ultrasonics. Wild and Neal[59,60] have deviced a procedure for detecting tissue changes by ultrasonic pulses. This group[61] has also used such a procedure for the detection of tumors in the brain. Other investigators[62] have similarly put these waves to diagnostic use.

Ultrasonics is becoming a valuable tool not only in the research laboratory and industrial plant, but is also proving its worth in therapy and diagnosis. Of course, there is much to be learned concerning these high frequency sound vibrations, but their potentialities are well appreciated.

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PSYCHOMETRIC EVALUATION OF LIPSTICKS

(Continued from page 199)

we obtained valuable data relating to subject differences and were also able to maintain a permanent record of our findings.

Incidentally, we have applied these same techniques to a variety of food and cosmetic problems with the same sensitive and reliable findings.

Having applied psychometric techniques to one peak of the lipstick cycle, namely indelibility, we then turned to the other, "high fashion," or purchase based on the hedonic properties of the product.

Determination of Consumer Motivation

At the outset, we recognized that a variety of psychological variables influence the consumer in her choice of a lipstick. Advertising, or artificial educational statements about perceptual properties, packaging, use by others, special promotions and price, all contribute to the sale of a lipstick or other consumer product. Lipsticks, while peculiar in some respects, do follow a marketing course which is similar to that of a number of other cosmetics and foods. All of these contributing parameters, when combined, can best be described in terms of the current vogue—motivation research. While we acknowledge the importance of motivation in consumer behavior, and the necessity for motivational research in marketing activities, we are loathe to apply the loose thinking of our more clinically oriented colleagues. Therefore, rather than ascribe lipstick-color-choice to an oral fixation, or to some other emotional manifestation, we prefer to look for contributing variables which can be more easily characterized and controlled.

The study to be reported is in the nature of a preliminary research designed to isolate just one or two of the factors which may influence choice of lipstick color.

Next to "high fashion," i.e., the influence of advertising, etc., we would predict that the most important influence in choice of lipstick shade would be the complexion type of the purchaser herself. This factor is apparently considered important by the lipstick manufacturers, at least, in view of the many lipstick promotions based on complexion type. In ads, lipstick colors are often grouped according to complexion type. These promotions of course rest on the assumption that complexion type is an important variable in determining lipstick color choice. It is this hypothesis which our present ex-permanent was designed to test. We shall use the expression, complexion type, by the way, as a general term to refer to a complex of factors including hair color, eye color, and skin type, of which hair color is probably the most important.

Color Preference

In order to study consumer preferences in lipstick color, we needed sample lipsticks which differed only

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Now that the self-styled experts have compiled the outstanding events of the past year, the average man will make his own list. After all, the difference between an expert and a non-expert is so often in the skill of the press agent rather than the client.

•

To nearly everyone, the end of hostilities in Korea will be the major item of interest. There have been times when many of us thought the only productive element in the fight about the 38th Parallel was the weird popular music of the same name.

•

In the competitive sports, highlights were shed by the Yankees Baseball team and Heavyweight Champion Rocky Marciano. Both proved that anybody could lick them except the fellers who really had to.

•

The show world had mixed emotions about the fabulous Gabor sisters, planning a joint night club appearance in Las Vegas. Those who like Eva, Zsa Zsa and Magda were delighted to find them in one place at the same time. Conversely, those who don't, were delighted at the opportunity to miss all three of them by avoiding only one night club.

•

Politically, President Eisenhower captured the spotlight in a pitch for world pooling of Atomic Energy information for civilian uses. Unfortunately, nearly all Russian civilians are not fashionably attired unless they're in military dress.

•

The automobile field, always bragging about its technologic advances, demonstrated another innovation. They sold brand new 1953 models below list price in order to make way for 1954, with toasters, vacuum cleaners and cash discounts as standard equipment.

•

This, of course, is a much more appropriate time for The Cosmetic Industry to review the last year. After all, a guy needs some comedy relief while itemizing other things for the March 15th deadline set by the toughest of all contemporary historians: The Director of Internal Revenue.

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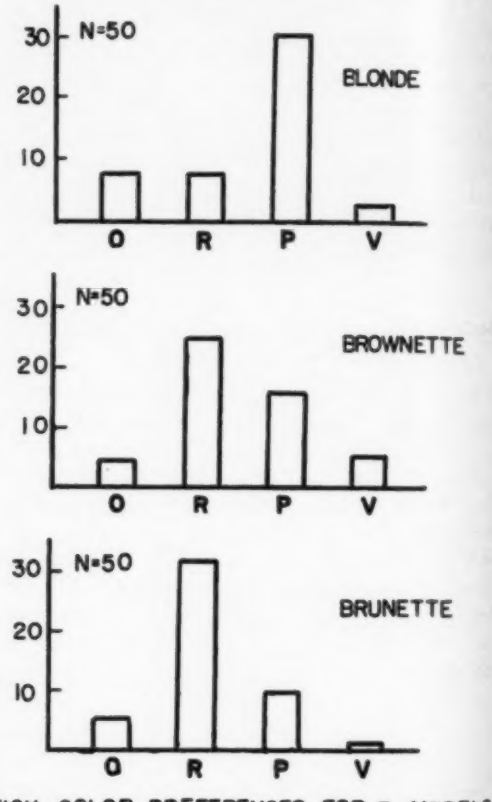
in color, keeping other variables constant. We therefore selected four lipsticks of the same brand, in colors chosen to represent the range of popular shades.



LIPSTICK COLOR PREFERENCES FOR 3 MODELS

O = Orange P = Pink
R = Red V = Violet

FIGURE 1

"Orange" was chosen to represent the bright orange-red end of the scale.

"Red" is a medium-bright, true red.

"Pink" is typical of the light bright pinks, and

"Violet" represents the dark blue-red end of the scale.

The first part of the experiment was designed to investigate relative preferences for lipstick colors when seen on *others*.

Three young women were used as models; they were chosen to represent as wide a range of differences in complexion as possible.

The first was a blonde, with blue eyes and medium fair skin.

The second was a so-called "brownette" with medium-brown hair, hazel eyes and medium complexion.

The third was a brunette, with dark brown hair and eyes and olive skin.

The general design of this phase of the experiment was that each model, wearing each of the four colors in turn, was observed and rated by 50 observers whose task was to decide which of the lipstick colors looked best on the model.

To allow for rapid comparisons between the four colors, we constructed a special device consisting of an upright adjustable support, with four radiating arms of clear Lucite. The arms could revolve freely, windmill-fashion. Near the end of each Lucite arm was fixed a piece of white paper in the shape of a pair of lips, and colored with one of the four lipsticks. The model, dressed in white, stood behind the apparatus and the arms were revolved so that each of the differently colored lips in turn appeared in place of the model's own lips. The 50 observers one at a time sat before the apparatus and were asked "Which of the four lipsticks looks best on the model?"

Results

Figure I shows the number of observers who chose each color for each model. Here some interesting trends develop. In the first place, there is a definite preference for the red and pink lipsticks over the orange and violet.

When the preferences are broken down according to the complexion-type of the model, we see a definite relationship between the model's coloring and the lipstick chosen for her.

For the blonde, pink lipstick is highly preferred over red; for the brownette, the true red pulls ahead; and for the brunette, the preference for true red over pink is still greater.

In other words—as complexion type changes from light to dark, there is a consistent shift in preferred lipstick color from pink to red. The difference between the color choices for the three models is statistically highly significant. Therefore we can safely conclude that the choice of lipstick color for *other women* depends on the model's coloring, rather than on the observer's individual color preferences alone. Otherwise we should expect the same distribution of preferences for all three models, since the same 50 observers were used in each case.

So it seems evident that preferences for lipstick colors *on somebody else* are dependent on that somebody else's complexion-type. This fact is certainly of some interest, but it does not strike at the roots of the problem which is of greatest interest to most of us—namely, what makes a woman actually buy a certain lipstick for herself? The second phase of our experiment was designed to investigate this vital question. Specifically, we wanted to know to what extent a woman's complexion type influences her selection of a lipstick color for her own use.

This problem was attacked in two ways. Our first approach was an attempt to simulate the essential features of the situation which exist when a woman purchases a lipstick for herself.

Self Selection

The four lipsticks were displayed, opened, standing in a row on a white background. Fifty-two women were used as subjects. They were called in individually and

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asked, "Which one of these lipsticks would you purchase?" As in a store, the women were allowed to pick up and examine the lipsticks at close range, but not to apply them to anything, and no mirror was available, so that judgments had to be made on the basis of stick color alone.

Our second attack on this problem, done at a later time, was an attempt to make the factor of complexion-type play a greater part. In this part of the study we used the lipstick wheel which I described earlier. Each of the 52 women, dressed in white, stood before a mirror while the four lipstick colors were placed over her lips, and she was asked which of the four colors looked best on her.

	LIPSTICK COLOR			
HAIR COLOR	Orange	Red	Pink	Violet
Blonde	0	2	1	0
Medium	6	8	2	3
Dark	6	11	1	2
Red	1	2	0	0
Gray	0	6	1	0
Total	13	29	5	5

TABLE I

Results

Table I shows relative color preferences as expressed by stick-choice; that is, in that part of the study in which the women chose lipsticks by stick color alone. The subjects are divided into complexion groups as indicated by hair color, and each figure shows the number of women in a given complexion group who chose a certain lipstick color. An examination of this table reveals no obvious relationship between hair color and lipstick choice, and as a matter of fact no possible analysis of these data could uncover such a relationship. Furthermore, when we analyze the data obtained from the second part of the self-selection study—the phase in which women looked in a mirror and chose the color which looked best on them—we find that only 9 out of 52 women changed their original selection.

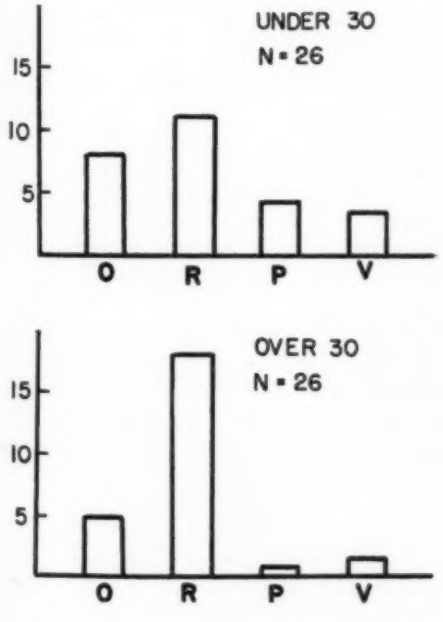
In other words, in this study at least we were not able to demonstrate any significant relationship between a woman's complexion and her choice of a lipstick color for herself. It is certainly possible that a further extension of this study, using a much larger number of women in each complexion group, might

uncover such a relationship, but at any rate it is not the all-important factor it is sometimes supposed to be.

Age Groups

Very well then—if complexion type is not important in lipstick choice, what is? Before seizing upon oral fixation as a last resort, let's consider another possible variable, namely—age. It seems reasonable that a woman's age might influence the lipstick color she chooses for herself, and with this in mind we divided our 52 women into two groups—those younger than 30 and those older than 30. When the results are analyzed according to this breakdown, we get the pattern that you see in figure II.

The upper graph shows the lipstick choices of the younger women, and the bottom graph the choices of the older women. Here we see a definite difference in the two patterns. For the younger woman, the choices distribute themselves among the four colors, whereas the older women display a marked preference for the medium-red lipstick—in other words, the women over 30 are more consistent in their choice of lipstick color. Because of the relatively small group used, this difference is not statistically significant, but based on the



LIPSTICK COLOR CHOICE ACCORDING TO AGE

O = Orange P = Pink
R = Red V = Violet

FIGURE II

strength of the trends obtained it is reasonable to believe that an enlargement of our panel to 100 women would certainly demonstrate the reliability of this pattern.

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* *Recent radio-activity tests conducted by independent research laboratory demonstrate conclusively that SeaKem Stabilizers remain on skin after repeated scrubbing and rinsing.*

Summary

The results of this preliminary search indicate that factors other than advertising or complexion influence the choice of lipstick color for one's own use. Age is one such other factor, and there may be others, but in any case, when a systematic analysis is applied, it is possible to isolate and characterize such variables.

You may say that such data is available from other sources, sales curves, market research, etc., but from these sources it is often possible only to *infer* information of this nature.

With the approach presented above, we have established under laboratory conditions, facts about lipstick purchase which heretofore fell into the category of "good business" or "market feel."

These psychometric techniques, while not absolute in any sense, are the beginnings of a standardization and tightening of analytic techniques in the cosmetic industry.

SILICONES IN COSMETICS

(*Continued from page 191*)

FORMULA No. 4
O/W Cold Cream

A	Mineral oil	30.0 per cent
	Beeswax	12.0 per cent
	Atlas G-1704	3.5 per cent
	Atlas G-1725	1.5 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	10.0 per cent
B	Water	42.0 per cent
	Borax	1.0 per cent
	Preservative	q.s.
C	Perfume	q.s.

Preparation: Heat (A) and (B) to 70° C. Add (B) to (A) slowly with thorough agitation. Perfume at 50° C. Pour.

This formula produces a stable, glossy cream which can be modified for other uses such as emollient cream or all purpose cream by addition of ingredients such as lanolin, hydrogenated vegetable oil or stearic acid.

Formulas No. 5 and No. 6 illustrate the use of silicone fluid in lotion type mineral oil emulsions. Formula No. 5 is an O/W lotion type hair dressing using a combination of non-ionic emulsifiers and soap. Formula No. 6, an O/W baby lotion, contains only non-ionic emulsifiers.

FORMULA No. 5
O/W Hair Dressing

A	Petrolatum	6.0 per cent
	Mineral oil	37.5 per cent
	Lanolin	3.0 per cent
	Beeswax	8.0 per cent
	Arlacel ® 83	3.0 per cent
	Arlacel ® 20	1.0 per cent
	Tween ® 20	2.0 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	1.0 per cent
	Borax	0.5 per cent
B	Water	38.0 per cent
	Preservative	q.s.
C	Perfume	q.s.

Preparation: Heat (A) to 70° C., and (B) to 75° C. Add (B) to (A) slowly with agitation. Perfume at 45° C. and stir until the emulsion reaches room temperature.

FORMULA No. 6
O/S Baby Lotion

A	Mineral oil	35.0 per cent
	Lanolin	1.0 per cent
	Cetyl alcohol	1.0 per cent
	Span ® 80	2.1 per cent
	Tween ® 80	4.9 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	5.0 per cent
B	Water	51.0 per cent
	Preservative	q.s.
C	Perfume	q.s.

Preparation: Heat (A) to 60° C., (B) to 62° C. Add (B) to (A) slowly with agitation. Perfume at 50° C. Continue agitation at room temperature.

Both formulas are stable lotions which are readily pourable. Formula No. 5 is more viscous than Formula 6.

The silicone fluids may also be incorporated in W/O emulsions, such as Formula No. 7, a lip pomade.

FORMULA No. 7
W/O Lip Pomade

A	Mineral oil	25.0 per cent
	Petrolatum	7.0 per cent
	Ceresin Wax	24.0 per cent
	Beeswax	7.0 per cent
	Atlas G-2859	3.5 per cent
	Tween ® 60	0.5 per cent
	General Electric Silicone Fluid SF-96 (1000 centistokes)	5.0 per cent
B	Water	28.0 per cent
	Preservative	q.s.
C	Perfume	q.s.

Preparation: Heat (A) to 65° C. Add (B) at 70° C. to (A) while agitating. Stir while cooling to 50° C. Add perfume-flavor compound and cast into heated molds. The silicone fluid included in this formula improves its application properties and promotes water repellency of the product.

FORMULA No. 8
Lotion Containing Sunscreen

A	Dypnone or suitable sunscreen	1.0 per cent
	General Electric Silicone Fluid SF-90 (300 centistokes)	10.0 per cent
B	Isopropyl Palmitate	89.0 per cent

Formula No. 8, a non-emulsified product, illustrates the use of a silicone fluid in a lotion containing a product reputed to have sunscreening properties. Isopropyl palmitate is used as the vehicle and Dypnone, oc-methyl sryryl phenyl ketone, a product of Carbide and Carbon Chemicals Company, is the active ingredient. The silicone oil improves the water repellency of the product, which is a clear oily liquid.

Preparation: Mix (A). Add (B) with stirring.

FORMULA No. 9
Lipstick Base

Castor oil or bromo acid solvent	30.0 per cent
Mineral oil	15.0 per cent
Beeswax	15.0 per cent
Paraffin	10.0 per cent
Carnauba wax	10.0 per cent
Ceresin wax	10.0 per cent
General Electric Silicone Fluid SF-96 (1000 centistokes)	10.0 per cent
Perfume-flavor compound	q.s.

Formula No. 9 shows the use of the silicone fluid in a lipstick base. The silicone oil decreases the water solubility of the base, thereby providing a possibility for increasing the life of a lipstick film on the lips.

The formulas described above illustrate the possible use of silicone fluid in some typical pharmaceuticals and cosmetics. The property contributed by the silicones which would probably be most important for these applications is water repellency. Although some of the formulas appear to possess this property as the result of inclusion of the silicones, further study, including actual use tests, by the pharmaceutical and cosmetic industry is necessary before their applicability can be adequately demonstrated.

Recognizing the need that the Toilet Goods Industry has for materials that are soluble in alcohols, silicone fluids have recently been developed that are miscible with ethyl alcohol and isopropanol. This is an example of how an industry such as yours can lead to the adaptation of a class of materials to fit your particular applications.

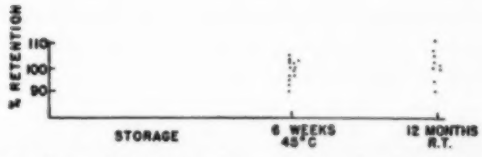
RIBOFLAVIN PHOSPHATE

(Continued from page 197)

mate riboflavin content of each concentration. They emphasize the case with which a wide range of riboflavin phosphate levels and the corresponding vitamin B_2 potency can be achieved.

Figure 5

Stability of Riboflavin-5'-Phosphate Sodium in B-Complex Parenteral Solutions containing Vitamin C



The data plotted on Figure 5 clearly show that the B_2 phosphate is stable in multivitamin solutions containing vitamin C. The majority of these data, which are obtained from laboratory lots, fall within plus or minus three per cent of the initial values found in the samples.

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Here are additional data in Figure 6 that are essentially replicate of those shown in the previous figure. These values represent B_2 phosphate levels from 4.5 mg. to 15 mg. per cc. These data and those in the previous

Figure 6
Stability of Riboflavin-5′-Phosphate Sodium in B-Complex Parenteral Solutions Without Vitamin C

table demonstrate the stability of the phosphate ester in multivitamin parenterals with and without vitamin C over a wide potency range. No losses have been observed in straight B_2 phosphate solutions with concentrations as high as 30 mg. per cc.

Table 2
Riboflavin Equivalent in Parenteral Solution Actually Prepared with Riboflavin-5′-Phosphate Sodium

TYPE	CONCENTRATION OF B_2 PHOSPHATE MGS. PER CC	EQUIVALENT RIBOFLAVIN CONCENTRATION MGS. PER CC
Straight B_2	13.0	9.0
Straight B_2	30.5	21.9
B Complex	3.0	2.1
B Complex with C	4.5	3.1

The data in Table 2 show the riboflavin equivalents in parenteral solutions that have been successfully prepared. The riboflavin values are based on the minimum content of riboflavin in riboflavin-5′-phosphate sodium. By actual assays in practice the riboflavin values are found to be about one to two per cent higher. There are indications that riboflavin-5′-phosphate sodium may be employed to prepare certain parenteral solution formulae with yet higher concentrations of vitamin B_2.

Esterification of riboflavin does not affect fluorescence in the maximum range. Thus the curves for riboflavin

Figure 7
Fluorescence Curve of Riboflavin-5′-Phosphate and Riboflavin

and riboflavin-5′-phosphate on a riboflavin equivalent basis are almost superimposable (Figure 7). This may be of particular interest to those in analytical work.

It was observed that the phosphate ester in the very dilute solution employed for assay work is more sensitive than riboflavin to light. Consequently, appropriate precautions must be taken to avoid exposure to light during analytical procedures. Such special precautions are essential only at the very low concentrations involved in the analysis and not at usual pharmaceutical levels, which are at least two thousand-fold higher.

While mentioning precautions there is another regarding riboflavin-5′-phosphate. The material will react with calcium and the heavy metals. The presence of such cations will result in precipitation of the insoluble salt of the phosphate ester. Calcium pantothenate, therefore, should not be included in solutions with B_2 phosphate. Panthenol, the alcohol analog of pantothenic acid can be used without incompatability.

Table 3
Advantages of Using Riboflavin-5′-Phosphate in Parenteral Solutions

1. Higher concentrations in all products—ready-made and lyophilized
2. No chloroflavin formation
3. Elimination of solubilizers which themselves:
   a. May contribute toxicity
   b. Increase pain at site of injection
   c. Tend to "crowd" solutions and increase hypertonicity
   d. Create labeling problems
   e. Introduce reducing properties which enhance chloroflavin formation

In our studies no instance of chloroflavin formation has been observed in any parenteral solution containing rivoflavin-5′-phosphate sodium.

Any advantages found in the use of an ingredient or a process for parenteral preparations should essentially also apply in oral solutions. This is true with riboflavin-5′-phosphate sodium. Using the new B_2 phosphate much higher levels of vitamin B_2, than are obtainable with riboflavin U.S.P., may be easily incorporated in oral liquid products.

A series comprising two multivitamin elixirs and a syrup were prepared to cover a range of 16 to 64 mg. of riboflavin content per cc. The oral solutions in this series were adjusted to pH 4.0 and included samples both with and without ascorbic acid. Assay checks after fourteen months' storage at room temperature showed stability of the riboflavin phosphate quite similar to those reported for the parenteral solutions shown in Figures 5 and 6. Physical appearance is still excellent after more than fourteen months' shelf life at room temperature.

In a series of polyvitamin drop preparations containing riboflavin-5′-phosphate sodium quantitative recoveries of the initial B_2 content have been obtained after storage for 1000 hours at 45° C.

Table 4

Advantages of Using Riboflavin-5′-Phosphate in Oral Solutions

Type of Product	Riboflavin Range Mgs. Per Teaspoon Dose	B_2 Phosphate Range Mgs. Per Teaspoon Dose
1. Syrups	0.2-1.0	10.0 . . .
2. Elixirs	0.1-1.0 (Solubilizers)	10.0 . . .
3. Polyvitamin Drop Preparations	1 Mg./cc.	3.0

Table 4 shows the approximate range that is obtained with riboflavin and what may conservatively be accomplished with riboflavin-5′-phosphate sodium in oral solutions.

It may be interesting to note that the B_2 phosphate can be effectively used in rapidly soluble tablets and soft elastic capsules for aqueous solutions or dispersions. Likewise, for dual vial preparations, dry mixes with substantial B_2 content can be prepared without recourse to lyophilization methods. Combining the dry mix and the menstruum effects solution readily, just as with lyophilized products.

While these last mentioned types of preparations are not categorically solutions, they are sufficiently close to be included in this discussion. Such developmental approaches merit consideration and indeed are being evaluated in certain investigational programs.

THE STORY BEHIND COUMARIN

(*Continued from page 187*)

purchasers would therefore be buying such foods at their own risk.

In the Hazleton experiments, the laboratories found that when they fed the animals coumarin at concentrations of 250 parts per million, no significant changes were noted. But when they fed them coumarin at 2,500 parts per million, the concentration was strong enough to damage the animals' livers severely.

The critics of the Hazleton findings retort that almost any food or flavor ingredient would be toxic in such high concentration, and therefore the experiments prove very little.

Compare these coumarin feedings with the former coumarin content in some of the foods in the average human diet. Based on the facts that (a) 1/8 ounce of coumarin was used in each gallon of artificial vanilla extract, (b) 2 ounces of artificial vanilla extract were used in 100 pounds of cream centers for candy, and (c) 4 ounces of extract were used in 60 pounds of batter for baking, the following proportions can be calculated:

0.0000195 ounce of coumarin is used in one pound of cream centers for candy.

0.0000652 ounce of coumarin is used in one pound of batter for baking.

In other words, the concentration of coumarin in

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cream centers was 1.21 parts per million, and in baked goods, 4.08 parts per million. Or, saying this another way, if a man had eaten 100,000 pounds of cream centers (which he could not do in several lifetimes) he would have consumed 1.95 ounces of coumarin. By the same token, if he had eaten 100,000 pounds of baked goods, he would have consumed 6.52 ounces of coumarin.

A ludicrous comparison alongside the 250 and 2,500 parts per million used in the animal experiments? No, perhaps not, because General Foods realized that a few new foods were being made with coumarin concentrations as high as 200 parts per million. This company reasoned, and the four producers agreed, that an element of danger might exist, since the coumarin used in foods might conceivably be increased to a level where humans could be injured. Not only that, it is entirely possible that individuals would eat unbalanced meals heavy in the high-coumarin-content foods.

While there is no proof or evidence that coumarin toxicity is cumulative—that is, that small amounts of coumarin remain in the body from day to day and gradually build up to an injurious level—the experiments on the rats and dogs did show that it was possible to bring about a chronic coumarin toxicity at a high level of feeding.

There is a concentration, therefore, somewhere between 250 ppm and 2,500 ppm at which level the chronic toxicity begins to show itself in the animals, and there is probably a similar level, say the chemical men, at which it begins in humans. This level has not been determined yet, and so the companies feel it is unwise to subject human beings to a possible risk.

Although there are some who believe the F.D.A. and private industry picked on coumarin unfairly, this point of view is highly questionable, for each of the coumarin-producing companies lost considerable sums of money by refusing to sell the chemical for food flavoring. Monsanto Chemical Company, alone, sustained a heavy sales loss, running into six figures. A spokesman for that firm recently stated, "You may well ask whether we don't have some misgivings about the very strong position we took last summer. I have just checked with the people who made that decision at that time and find the answer is an emphatic *no*."

Each of the four coumarin-producing companies further confirmed this viewpoint last year when they sent letters to their customers explaining their reasons for withdrawing the coumarin from the market. The Dow Chemical Company's letter, which is representative of the group, put it this way:

"Recently there came to our attention some data on the toxicity of coumarin that casts some doubt on the safety of its widespread use in foods. These data are not yet published but we expect they will be placed on file with the Food and Drug Administration.

"As you know, coumarin has been used in foods for approximately 75 years. We know of no harm that has resulted from this use, nor can we say positively that its continued use would result in harm. We do feel, however, that the increasing use of coumarin would approach too closely the limit of safety and we do not want to gamble where health is concerned. For this reason, we are withdrawing coumarin from the food field. These data pertain only to the food industry and we see no reason why its use in other fields cannot be continued.

"We can appreciate that this development will cause you some difficulty. We have no immediate answer in that we do not have a single substitute product that would be suitable in all applications. We do have facilities for creating flavors for a specific job and we are most anxious to work with you on your problems."

The non-food uses for coumarin referred to in the letter include metal plating (the coumarin helps brighten the finish), soap and tobacco. The individual producers were selling from 20 to 50 per cent of their coumarin for these purposes, and from 50 to 80 per cent for flavoring, before they withdrew it from the food market.

Coumarin is a chemical additive; that is, a chemical ingredient which is added to foods to produce a pleasant background taste, a bouquet. It is not a necessary, or an indispensable, ingredient, for combinations of other chemicals and flavors can be substituted to produce the same, or very similar, results. It has been used largely in conjunction with vanilla flavor, and also in many other flavors, such as cherry, loganberry, peach, pear, grape, maraschino, blackberry, violet, strawberry and honey.

Under the meaning of the Food, Drug and Cosmetic Act, no food that is adulterated can be shipped in interstate commerce. Defining this particular word, Section 402 of the law states that a food is *adulterated*, "If it bears or contains any poisonous or deleterious substance which may render it injurious to health." However, if that poisonous or deleterious substance is not an added substance, but is a naturally occurring ingredient already in the food, then that food is not adulterated, provided the substance is present in such a small quantity that it "does not ordinarily render it injurious to health."

In dealing with chemical additives (such as coumarin), Section 402 states that a food is adulterated, "if it bears or contains any added poisonous or added deleterious substance . . . except where such substance is required in the production thereof, or cannot be avoided by good manufacturing practice."

In other words, if a particular chemical additive is poisonous or deleterious, and if it is not required in the manufacture of the food under question, then that additive cannot be used in any food in any concentration, because the resulting food would be adulterated. This is true even though the concentration used is perfectly safe.

Under the meaning of the law, therefore, if the F.D.A. makes a final ruling to the effect that coumarin is poisonous and deleterious, the chemical cannot be used in foods.

Is it proper to bar such a commonly used ingredient

as coumarin from all foods because it is toxic in large concentrations? What about the proverbial common table salt? Pepper? Nutmeg? As a matter of fact, just about any food is poisonous and deleterious in excessive amounts, an idea which the Germans have expressed most capably in a single word, *Uebermass*, meaning, "Excess, eating too much." It also means, "Poison."

Of course, there are many additives which, by their very nature cannot possibly be taken in excess. Pepper is one. Before an individual could even swallow enough pepper to do him harm, his mouth would burn so terribly he would stop there. A flavor like coumarin is different.

A large amount of coumarin, by itself, would taste so bitter that it could not be eaten either. But it is possible, however, to incorporate higher-than-usual amounts in foods, because accompanying flavors tend to mask the strong coumarin taste, making it more subtle. This factor, say the coumarin producers, contributes to the risk of using such a flavor.

Under the strict sense of the law, many of the spices and flavors—some of which have been used for decades, even centuries—should conceivably be removed from U. S. foods, for they, too, are poisonous and deleterious in large amounts, as illustrated by the experience of a former New Jersey hotel owner.

She was checking stock in the hotel storeroom one morning a number of years ago and came across some nutmegs, each about the size of an olive. Liking their taste, she put one in her pocket to nibble on during the day. The nutmeg was so hard, she had to scrape her teeth against its surface, and in so doing, was able to eat less than a quarter of it all day long.

After dinner that evening a doctor was summoned because her eyes were dilated. She acted drunk and could not remember what she was reading from one word to the next. The doctor pulled her out of the chair, kept her walking for the rest of the night, frequently lighting matches in front of her eyes, and inducing her to drink black coffee. Had she lain down and gone to sleep, he said, she would have died of myristicol poisoning.

If a chemical additive that is poisonous and deleterious is required in the manufacture of a food or cannot be avoided by good manufacturing practice, Section 406 of the Food, Drug & Cosmetic Act continues, "The Administrator shall promulgate regulations limiting the quantity therein or thereon to such extent as he finds necessary for the protection of public health, and any quantity exceeding the limits so fixed shall also be deemed to be unsafe . . ."

Under the meaning of the law, then, if a poisonous and deleterious substance is necessary in a food, the F.D.A. must determine a tolerance for that substance, describing just how much can be used.

This is an important point, and a very difficult one to pin down. If a manufacturer of a food product wants to add a poisonous and deleterious substance to a food, he must first prove the substance is a necessary

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ingredient. What determines necessity? The fact that a product cannot be made without the specific substance, or that it would be too burdensome to manufacture the product without it? Just where does the hardship begin?

Some additives might be required in one case, not in another—like arsenic and lead which are used as insecticides in spraying fruit. The F.D.A. has set up tolerances on both these chemicals to prevent injury to any individual who might eat some sprayed fruit without washing it thoroughly.

The Food and Drug Administration is instructed by law to establish tolerances for required poisonous and deleterious additives. Perhaps the law should also permit the F.D.A. to set up tolerances for those additives, like coumarin, which are not required, and, which after having been used for many years with no apparent toxicity, may now be ruled poisonous and deleterious under the law.

This does not pertain to new "poisonous and deleterious" additives, but only to those which have been used for many years and have demonstrated their safety in normal usage. Charles W. Crawford, speaking at the Symposium sponsored by the Manufacturing Chemists' Association in New York in January, 1952, said, "Reading the statute impresses one with the clear intent of Congress to go further than merely insuring that no single food will itself carry enough poison to jeopardize the health of the consumer. The purpose was to safeguard the nation's food supply so that the over-all quantity of toxic substances, in all the items that make up the varied diet characteristic of American people, will be held at safe levels."

The F.D.A. would first have to know the toxicity of each chemical additive; that is, at what concentration the chemical would produce injury. The tolerance for that chemical could then be set at a concentration safely below that level so that it would not produce a hazard. The word, *hazard*, here means the chance that an injury will result from the use of a substance in the quantity prescribed in a given recipe.

The Food Protection Committee of the Food and Nutrition Board, National Research Council, reporting on chemical additives in 1951, stated, "There need be no hazards involved in the use of chemical additives in foods, provided adequate scientific research programs are carried out prior to the use of an additive. The fact that a chemical is toxic does not mean *per se* that its proper use as an additive will entail a hazard to man.

"Practical and effective, though not perfect, scientific techniques," the report continues, "have been worked out to determine the toxicity of chemicals to laboratory animals. Taking into consideration the toxicity of the chemical, the amount proposed for addition to foods and the variety and types of food to which it is proposed to be added, it is possible to reach an expert judgment of the hazard involved. With this information available, no reputable manufacturer would add any chemical to food when a hazard to the public is involved."

Perhaps this idea is already taking hold. In January, 1953, before the coumarin data were obtained, the F.D.A. began conducting its own tests on 15 flavoring agents which are among the most widely used today. They include allyl caproate, anethole, anisaldehyde, benzaldehyde, benzyl cinnamate, carvone, dimethyl benzyl carbinol, ethyl methyl phenyl glycidate, ethyl pelargonate, ethyl sebacate, eugenol, isoeugenol, piperonal, thymol and vanillin. Well over half of these chemicals have been used for many, many years, but this time-element is no longer a guarantee that their use is legal.

Early last month, in January, 1954, the F.D.A. asked the Flavoring Extract Association to submit data on 50 aromatic chemicals, including the original 15. The administration wants to know what foods the chemicals are used in, the percentage in which they occur in each food, and other pertinent facts.

The flavoring people are cooperating with the F.D.A. in this matter, but they still feel it is unnecessary. Their point of view is that many of these flavors have been used for a long time, with no evidence of harm, toxicity, or poison having ever been inflicted on any human being. They see no reason for spending so much time and money testing these flavors when, through the years, they have proven harmless in the quantities in which they have appeared in various foods.

The Food and Drug Administration has been assigned the task of protecting the health of the people by making sure no food ingredients are hazardous. Setting up tolerances of these ingredients is one of the ways this can be accomplished. Another way is by establishing standards of identity for food products. This has already been done in many instances, such as for jams and jellies, bread, and chocolate products. These standards are actually government recipes which specifically list all the ingredients that must go into the particular foods, as well as the optional ingredients which may be added, if the manufacturer wishes. No other ingredients may be used.

There are many foods for which the federal agency has not set up standards of identity. In these nonstandardized foods, manufacturers are free to put any ingredient they see fit. Obviously, the food processors and manufacturers take on a heavy responsibility when they add a new, or unusual, chemical to such a food, and they should be prepared to face that responsibility.

On many occasions in the past, the F.D.A. has caused products to be withdrawn from the national market because it considered them hazardous to the public. In doing this, the Food and Drug Administration assumes a great responsibility and is always open to sharp criticism from those companies whose products are affected. It is not an easy decision to make.

On the other hand, if the chemical and flavoring industries were left to their own devices, with no F.D.A. looking over their shoulders, there might be great danger. While the industries are honorable, there is no doubt that some firms would attempt short cuts in order to enlarge profits or save expenses, all to the

detriment of the nation's health.

In today's modern chemical age, every reliable chemical organization dealing with food maintains its own toxicological laboratory, or calls on the services of a private laboratory. Each company makes exhaustive toxicity tests on every new food product, and, when satisfied with the results, generally confers with the F.D.A. before marketing that food.

The companies do this, not only for the safety of the consumer, but also for the safety of their own employees who handle the chemicals. This is not altruism. It is good business. No company can survive long in this competitive field if it has a reputation for manufacturing questionable foods.

This cooperative arrangement between the F.D.A. and the chemical and food industries is highly desirable, and indispensable. The F.D.A. has voiced the hope that the same close relationship will eventually exist in respect to the flavoring industry, where at present there are only a limited number of toxicological laboratories.

That agency further states that it lacks the manpower to carry out all the necessary tests on the flavoring ingredients without some outside help.

The flavoring industry, in turn, replies that it is not up to them to do the toxicological work; it is the F.D.A.'s task. Their industry, they say, is not big enough to support such an intensive program which would require a large number of specialized laboratories.

Regardless of how this problem is solved, it is apparent that pre-testing of new flavor ingredients may soon be required. Some group will have to do the job.

Much of this opposition stems from an honest disagreement with those procedures which the F.D.A. has already carried out. Much opposition also arises from the fact that, if tolerances are set up on flavors of long standing, or if any flavors are removed from standards of identity, some companies are bound to be hurt. There are many cases in which flavors, like coumarin, have been used for 75 years or more, and have never been questioned. Flavor manufacturers have spent large sums of money developing these additives and incorporating them in flavor compounds, certain that they are perfectly safe to use. Obviously they do not relish the possibility of having to change their formulas, and perhaps the flavor of the individual products—all at great expense, and with the chance of losing popular sales appeal—especially when they do not feel it is absolutely necessary.

Owing to this widely publicized controversy dealing with chemical additives, the American public is becoming increasingly conscious of the subject, "Chemicals in Foods," and is often led to believe that the disagreement is based on an illusory battle between natural and synthetic ingredients. This is not the case at all.

Coumarin is an excellent example. In recent years, most of the coumarin used in foods has been prepared synthetically; in former years it had been obtained as

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a natural product from the tonka bean. If coumarin is declared poisonous and deleterious, the law, as it stands, will not permit the chemical from either source to be added to foods, for, as far as the toxicity is concerned, it matters little whether a food ingredient is a natural or synthetic product.

The food, flavoring and chemical industries, along with the various government agencies, through their efforts to examine all food ingredients for toxicity, have made America's food the safest in the world. Moreover, the chemical and flavoring industries have helped the United States to become one of the best-fed countries. They are constantly seeking, developing and testing new chemical additives (like antioxidants, to prevent spoilage of fats; flavors, to enhance the taste, and vitamins), thereby greatly increasing the nutritional value, variety and wholesomeness of the American diet.

The coumarin incident shows how this toxicological work is constantly going on. It also shows that a more careful scrutiny of those well-established food ingredients—for many years assumed to be perfectly safe—is necessary, in order to assure that this nation continues to rank among the most well fed in the world.

PATENT THOUGHTS AND TRENDS

(Continued from page 265)

manent waving art anticipating McDonough's claimed compositions.

Inasmuch as information on the first three points has already been disseminated (albeit with different conclusions having been drawn) we shall here single out what the report has to say on the contemporary development of cold wave lotions.

A. Contemporary Development of Cold Wave Lotions

The record disclosed that commencing in the latter part of 1940 others than McDonough were engaged in the development of cold waving lotions using mercaptans—particularly thioglycolic acid—as the waving agent. The commercial success of Willat's circulating system was no doubt in part responsible for this activity; Willat having shown that cold waving was a practical reality, it could be expected that a search would be made for a "satisfactory substitute" which would not present the odor and toxicity problems present with ammonium hydrosulfide, the waving agent used by Willat.

By March, 1941, demonstrations were being given in New York City and elsewhere with thioglycolic acid cold waving lotions by an inventor named Harry Martin, as well as by National Minerals Company, predecessor of Helene Curtis, one of the plaintiffs in this action. Others, such as Willat, himself, and Raymond Laboratories, Inc. soon followed suit. While not all of the developments were independently achieved, nevertheless one by one, McDonough's co-workers arrived at approximately the same answer.

Among the first to hit upon mercaptan cold waving was Harry Martin. Martin was not a chemist; his previous experience was in the cleaning and dyeing business where over a period of years he had experimented in the treatment of wool fabrics with chemicals. His first work in the permanent waving field took place in 1936 or 1937, and as early as 1939 he had prepared a mercaptan lotion for hot waving which was sold commercially under the name of "Kurene." Kurene consisted of sodium thioglycolate and ammonia, along with other materials to mask the odor, and was used as a waving aid and hair conditioner to be applied before the actual waving process got under way. Martin testified that in 1938 he started work on cold permanent waving lotions, having noted Speakman's disclosure of cysteine hydrochloride. He was looking for sulfur-containing compounds and hit upon the mercaptans, although he didn't know what they were at the time. He produced records showing purchases of sodium thioglycolate and thioglycolic acid from chemical concerns in November, 1940 and January, 1940. He testified that by the end of 194i, his preferred formula consisted of sodium thioglycolate, ammonia and witch hazel dissolved in water, the solution having a pH of from 9.5 to 9.6. This is amply supported in the record by a letter from his counsel, dated December 16, 1940, confirming its disclosure.

Defendant claims that Martin in fact had no satisfactory waving lotion until after Martin had contacted Willat and Willat had advised him how to alter his lotion based upon Willat's testing of lotion supplied to him by McDonough. This theory is not borne out by the record. While it is true that Martin's methods were crude and his knowledge scanty, there can be no doubt that he had developed a successful thioglycolate waving lotion prior to any contact he had with McDonough through Willat or otherwise. Indeed, on March 10, 1941, Martin gave a demonstration of his waving lotion at defendant's laboratory which was attended by Evans, and various Sales Affiliates' employees including Mc-McGoldrick. McGoldrick, who gave an on-the-head wave with Martin's lotion, reported that the results were satisfactory. Likewise, almost every contemporaneous record of Martin's thioglycolate lotion—records made by others than Martin himself—corroborates the fact that Martin's lotion was useful and had commercial signifiance. Indeed, Ashford, an associate of Willat, testified that when he and Willat tested McDonough's and Martin's lotions side by side in late May or early June of 1941, Martin's lotion was far superior and that twice the amount of McDonough's lotion had to be used to obtain a wave equal to that of Martin's.

In the summer of 1940, Samuel Grant, then President of the Acme Cosmetic Company, a wholly-owned subsidiary of National Mineral Company, observed a demonstration of the Willat circulating system and embarked upon a research program to find a substitute for Willat's ammonium hydrosulfide. His first step was to conduct a literature search (the work of Jass, which has been referred to earlier) and as a result of this search, decided that mercaptans might be a satisfactory

substitute because of their known depilating properties. He testified that his very first test, using a 10 per cent thioglycolic acid solution at a pH of 10 with monoethanolamine (a weak base), proved successful. On the following day, he or his assistants prepared thioglycolic acid solutions using ammonium hydroxide as the alkaline agent. Again, his results were successful and he immediately reported his findings to his superiors at the National Mineral Company. After further experimentation, he prepared a patent application on January 2, 1941, covering the broad class of mercaptans in an alkaline solution. In his specification, Grant disclosed the pH range from seven to 12 and expressed a preference for thioglycolic acid.

Grant's work presents still another instance of an antecedent reduction to practice of at least one, and probably several, species of McDonough's generic invention. Indeed, in Grant's case, which defendant acknowledges to be special, the evidence is convincing that Grant arrived at the generic invention itself—alkaline solutions of substituted mercaptans—substantially prior to McDonough. Defendant would have us substitute for uncontroverted evidence in the record, speculation that Grant might have derived some information from the Evans-Sales Affiliates organization which led him to the use of mercaptans. If speculation were to be indulged in, a reverse inference might well be drawn. For the record is clear that Grant demonstrated his cold wave lotions, using a circulating method, in New York as early as March, 1941, and that these demonstrations were a matter of public knowledge in the industry. It is just as plausible to infer that McDonough's intensive wo k on mercaptans commencing in April, 1941 was motivated by these and Martin's demonstrations.

In 1940 Raymond Laboratories, Inc., was also a manufacturer and supplier of waving lotions and beauty parlor supplies. It too was aware of the cold wave developments, and some time prior to November, 1940 made contact with Harry Martin. In November, 1940, it entered into an agreement with Martin for the development and commercialization of his cold wave lotion. Apparently there was much dissatisfaction on both sides of this agreement, and it was terminated in January of 1941. At about that time Raymond Lee, president of Raymond Laboratories, engaged a chemist named Reed to conduct research on the development of a cold wave lotion. Reed testified that he had been impressed by a talk given by Milton Harris, another chemist, in January, 1941, concerning the significance of di-sulfide linkages in keratin for permanent waving. According to Reed, one of his first moves after going to work for Raymond Laboratories was to engage Harris on a consulting basis. Reed claimed in his testimony that it was Harris who first urged him to focus on thioglycolates as the answer to the cold waving problem, and there is corroborative evidence in the form of memoranda from Harris to Reed which support this. However, there is also uncontrovertible evidence that Martin had already disclosed the components of his

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waving lotions to Raymond Laboratories by this time. Moreover, Reed, as early as May 9, 1941, had a sample of Grant's cold wave lotion, which consisted of ammonium thioglycolate. Reed conducted his first test with ammonium thioglycolate on June 23, 1941, and by July 11, 1941, was giving successful commercial waves at a beauty salon in St. Paul, Minnesota.

It is obvious that Reed's work is of no value in showing either a reduction to practice before McDonough's filing date or an independent arrival at mercaptan cold waving. Nevertheless, Reed's work is significant in that he was able, within a few days of experimentation, to determine the optimum pH and concentration for permanent waving with ammonium thioglycolate, and he also noted that with lower mercaptan concentrations, higher pHs were necessary for effective waving. This, in substance, is the same principle which McDonough inserted in his specification and claims shortly before the patent issued.

Willat is the last of the contemporaneous workers relied on by plaintiffs to show prior use. Willat, whose main base of operations was on the west coast, came east in May of 1941 desperately searching for something which he could substitute for ammonium hydrosulfide in his circulating system. He testified that shortly after his arrival in New York, he was in contact with an attorney by the name of Hower who suggested the use of thioglycolic acid as a substitute by showing him a tube of Imra, a depilatory product, which listed thioglycolic acid as one of its constituents. Ashford, who worked with Willat after the latter's arrival in New York, supported his testimony in this respect. Willat testified that on the following day, he and Ashford purchased thioglycolic acid and ammonium hydroxide and began to make up waving solutions in the basement of Ashford's home. Willat testified that within a week he had developed a lotion with which he gave a successful on-the-head wave.

Despite Willat's denial that he had derived his lotion from either Martin or McDonough, the fact remains that at this very time, Willat had samples of and access to both Martin's and McDonough's lotions. While it is possible that neither McDonough nor Martin informed Willat directly as to what they were using as waving agents, nevertheless it would not have been difficult for Willat to ascertain that both were using mercaptans, or that Martin at least was using a thioglycolate lotion. Accordingly, Willat, like Reed, cannot be given any status as an independent discoverer of mercaptan waving.

Other Issues

There were several other legal issues in the suits, such as inoperativeness, indefiniteness, new matter, etc., but these are not believed to be of general interest.

Infringement

The patent owners did succeed in convincing the Special Master that most of the alleged infringing preparations did in fact infringe. At this stage of the proceedings that is a pyrrhic victory, for no redress at all can be obtained so long as the claims stand invalid. However, should the claims be held valid, either by Judge Kaufman or the court on appeal, then of course the story would be different.

RECENT PATENTS

2,659,689—**Van Dyk & Co.—Benzoic Esters.**
2,659,090—**E. H. Slaybaugh—Effervescent Barium Sulfate-Pectin X-Ray Contrast Composition.**
2,659,700—**R. M. Carson & R. R. Saeks—Composition for Testing for Glucose in Biological Fluids.**
2,659,722—**Lovens kemiske Fabrik (Denmark)—Penicillin Salts of Aminoalkylhydroxybenzoates.**
2,659,723—**E. A. H. Friedheim—Triazine Organometallic Compounds.**
2,659,725—**G. D. Searle & Co.—Quarternary Ammonium Salts of Heterocyclylalkanol Esters of Xanthene-9-Carboxylic Acid.**
2,659,728—**Smith, Kline & French Labs.—Bis-Hydroxytetrahydroisoquinolyl-Alkanes.**
2,659,729—**Mathiesen — Alkylene - bridged 5,6'-Dihydroxyquinolines.**
2,659,730—**Schenley Industries—2'-(4'-Lower Alkanoylaminobenzal) - 6 - Acetylamino - Hydrazinobenzothiazole-2.**
2,659,732—**G. D. Searle & Co.—Quat. Ammonium Salts of Dialkyl Aminoalkyl Xanthene-9-Carboxylates.**
2,659,733—**Merck—Producing Butyrolactones.**
2,659,741—**Upjohn—11-Keto-17 Alpha-Progesterone.**
2,659,742—**Syntex S. A. (Mexico)—Delta^{1,3}-Allopregnenes.**
2,659,743,4—**Upjohn—11 Alpha, 17 Alpha, 21-Trihydroxyallopregnanes.**
2,659,757—**Ciba — Alpha - Aroyl - beta - Trichlormethyl-Ethylenes.**
2,660,582—**Cilag Limited (Swiss)—Quat. Nicotinic Acid Amides.**
2,660,584—**Wisconsin Alumni Research Found.—Prepn. of 17-Carbalkoxy Steroids.**
2,660,585—**Upjohn — 17 - Alpha - Hydroxy - 4 - Pregnene-3,6,20-Trione.**
2,660,586—**Upjohn—11 Alpha-Hydroxy-17 Alpha-Methyl-Testosterones.**
2,660,587—**Upjohn—8 - Hydroxy -4 - Androstene - 3,17-Dione.**
2,660,607—**Eaton Labs.—Prepn. of 2 - Hydroxyethyl-Hydrazine.**
2,660,608—**Hoffmann-La Roche—Branched Chain Octadecenone.**
2,661,315—**Mathieson Chem. Corp.—Prolonged-Effectiveness Injectable Penicillin Preparation.**
2,661,316—**H. S. Martini—Cosmetic Composition Containing Lanolin in High Concentration.**
2,661,350—**Schenley—Isothiuronium Salt of Penicillin.**

2,661,351—G. D. Searle & Co.—N-Alkyl-9-Xanthene-Carboxamides.

2,661,352—Nepera Chem. Co. — 7 - Substituted Dialkyl Xanthines.

2,661,353—G. D. Searle & Co.—N,N-Disubstituted 9-Xanthene-carboxamides.

2,661,356—Armour & Co.—Separation of Bile Acids.

2,661,357—G. D. Searle & Co.—Production of 16-Keto-17-Hydroxy Steroids.

2,661,368—Hoffmann-La Roche—Prepn. of Disubstituted Propargyl Acetoacetates and Decarboxylation of Same.

2,661,370—May & Baker Ltd. — Hexamethylene - 1:6-Bis-Trimethylammonium Bitartrate.

2,661,371—Int. Minerals & Chem. Corp.—Purification of Tyrosine.

2,661,372—Troponwerke Dinklage & Co.—Pharmacologically Valuable Stereoisomers of Certain Amino Alcohols.

2,661,373—Fritz Kulz et al—Amino Alcohols and Ketones.

2,662,046—Merck—Parenteral Amino Acid Solution.

2,662,047—Miranda Bros. Trading Corp.—Prepn. of Therapeutic Compositions from Spleen Tissue.

2,662,048—W. A. Winsten—Stable Vitamin B_{12}-Containing Composition.

2,662,076—G. D. Searle—Hyaluronidase Inhibitors.

2,662,077,8—G. D. Searle—Hyaluronic Acid Esters and Nitrates.

2,662,079—E. A. H. Friedheim—Organoantimony Therapeutic Compounds.

2,662,081—Upjohn — Purification of Synthetic Folic Acid.

2,662,082—Boots Pure Drug (England)—Phenanthridines Trypanocides.

2,662,088—Soc. Chem. et Atomistique—Purifying Dehydrocholic Acid.

2,662,089—Upjohn — 14 Alpha - Hydroxy - Androstenedrones.

2,662,092—G. D. Searle—Cycloalkyl Esters of Basically Substituted Isocyclylcarbamic Acids. For combatting hypertension and neuro-muscular spasms.

2,662,096—Ciba — Bis - (Substituted Phenyl) - Thioureas.

2,663,666—Organon Inc.—Prepn. of Crystalline Insulin from Acid Alcoholic Extracts of Pancreas Glands.

2,663,709—Smith, Kline & French Labs. — 1 - Alkyl - 6,7 - Dihydroxy - 1,2,3,4 - Tetrahydroisoquinolines.

2,663,710—Eaton Labs.—5 - Nitro - 2 - Furyl - 2 - Dialkylaminoalkyl Ketone Semicarbazones.

2,663,714—Eli Lilly—Hydrogenated Benz (CD) Indoles.

(Continued on page 294)

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(*Continued from page 293*)

2,663,716—Wisconsin Alumni Research Found—Short Total Synthesis of Estrone.
2,663,727—Parke, Davis—Diastereoisomeric Propane Derivatives.
2,663,728;—G. D. Searle—Hydroxy and Methoxy Cy clohexyl-Benzoylpropionic Acids.

ACID CREAMS

(*Continued from page 195*)

members of what is considered a less irritating group.

The best method now in general use for determination of the irritational factors is by testing the substance against the eye of albino rabbits according to the proposed method advanced by the Food and Drug Administration. If they pass this test, further development of the final product may be entered into since the indications are that the final form will also be innocuous. A final check however should be run on the product as it is to be marketed both against the rabbit's eye and the generally accepted use tests and patch tests.

Further work in the future seems to be indicated to determine whether or not some of the highly theoretical claims made by proponents of acid pH vehicles could be proven. There are some projects already set up with this end in view. The results should prove extremely interesting.

CHOLESTEROL

(*Continued from page 201*)

Hair conditioning creams are typified by the following examples:

COMPONENTS BY WEIGHT	(1)	(2)
Glyceryl Monostearate	12	—
Cholesterol	1.5	0.4
"Vitamin F"	—	1.0
Lanolin	1.5	2
Polawax	—	9
Lecithin	1.0	0.2
Avocado Oil	—	3.5
Triethanolamine Stearate	8	—
Cetyl Alcohol	—	5
Castor Oil	3	—
Lactic Acid	—	1
Water	73	78.5

The following formulations illustrate the use of cholesterol in hair dyeing creams, the first being an alkaline cream and the other two acid creams:[139]

COMPONENTS BY WEIGHT	1	2	3
Diglycol stearate	10.0	—	10.0
Sodium lauryl sulfate	1.0	—	—
Nitrated picramic acid	—	—	0.2
Rhodamine	4.0	—	—
Cholesterol	0.1	0.1	0.1
Lecithin	0.1	0.1	0.1
Acetic acid	—	0.1	—
Ammonia (20 per cent)	5.0	—	—
Ammonium acetate	—	—	0.2
Water	79.3	83.3	83.9
Glyceryl monostearate	—	10.0	—
Sapamine Base	—	2.0	—
Wetting Agent (Nekal BX)	—	1.0	—
Lawsone	—	2.0	—
Sulfonated Lauric acid	—	—	0.5

The preparations following are reported suitable for the removal of hair dyes from human hair:

COMPONENTS BY WEIGHT	1	2
Nitric Acid 40° BE	3	4.0
Hydrochloric acid	1	—
Oxalic acid	1	—
Ethyl Acetate	1	—
Cholesterol	0.02	2.0
Diethylene Glycol	3	2.0
Sodium Formaldehyde Sulfoxylate	10	—

(*Continued on page 295*)

A Selection of Hair Tonic Formulations is set out in the following Table

COMPONENTS	1	2	3	4	5	6	7	8	9	10
Liquid Paraffin grams	1.5	—	—	—	—	—	—	—	—	—
Cholesterol grams	0.5	0.5	0.5	0.2	0.4	0.2	1.0	1.0	0.25	0.3
Oxyquinoline sulfate grams	—	—	—	—	—	—	0.5	—	—	—
Sodium Choleate grams	0.5	—	—	—	—	—	—	—	—	—
Salycylic acid grams	—	—	—	—	—	—	0.2	—	—	—
Glycerin mls.	5.0	4.0	3.5	2.0	—	3.4	—	5	2.65	2
Boraz grams	0.5	—	—	—	—	—	—	—	—	—
Water mls.	89	4.5	20	20	4.0	20.0	—	12	13	13.6
Alcohol 95 per cent grams	—	91	—	70	90	70	275	75	75	80
Isopropyl Alcohol grams	—	—	76.0	5.9	10	5.5	—	—	5	—
Carbon tetrachloride grams	—	—	—	1.0	—	—	—	5	3	3
Lecithin grams	—	—	—	—	0.1	0.2	0.3	1.0	0.1	0.1
Castor Oil mls.	—	—	—	—	4.0	—	3.0	—	—	—

(Continued from page 294)

Distilled Water	39.98	52.0
Liquid Paraffin	—	40.0

Cholesterol, with other fatty alcohols, has been specified as a material suitable for inclusion in compositions for bleaching hair, prepared by admixture with an oxygen-liberating substance such as hydrogen peroxide, the agents preferably being used in the presence of polysaccharides or albuminous materials. Cholesterol is specially suitable for treating porous hair.

Hormones

Cholesterol is known to possess a chemical structure very similar to that of important hormones of the human body and it is now thought that steroid hormones are derived in the body from cholesterol.[95]

Cholesterol is in fact the starting point for the manufacture of some of the more important sex hormones. The male sex hormones, androsterone, testosterone and dehydroandrosterone have all been synthesized from it. The female sex hormone, progesterone, has also been obtained.[143]

Starting materials for preparing progesterone result by oxidation of cholesterol with oxidizing chromium compounds in the presence of sulfuric acid.[14] Another process consists essentially of the oxidation of cholesterol in sulfuric acid of 50 to not greater than 83 per cent strength, with chromic acid.[14-16] Androsterone has been obtained by first hydrogenating cholesterol to epidi-hydrocholesterol, using nickel, followed by oxidation of the acetate of this latter sterol with chromic acid.

Vitamins

Ordinary cholesterol, purified simply by crystallization, may be anti-rachitically activated by exposure to the action of the cathode ray and cholesterol, or cholesterol containing substances can also be rendered effective as pro-vitamins by oxidation with non-gaseous oxidizing agents of the hydrogen peroxide, benzoyl peroxide, eosin and chromic anhydride type.

In another example cholesterol is enriched in pro-vitamin D_3 by heating the sterol with solid benzoyl peroxide between 120° and 250°. Anti-rachitic material has also been obtained without irridation by treating cholesterol in acetic anhydride with sulfuric acid absorbing the active product on anionic synthetic resin.[185]

A weak anti-rachitic activation can be accomplished by treating cholesterol with floridin bleaching earth.

Nicotinic acid, a vitamin essential for the prevention of pellagra, may be converted into a water-insoluble form by esterification with cholesterol to produce cholesteryl nicotinate.[160]

Tablets

Cholesterol may be used to the order of one per cent as an emulsifying agent in pills and tablets as part of

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an enteric coating which will resist gastric juices for at least six hours, but which disintegrates within a very short time on passing into the intestinal tract, and a satisfactory coating for pills, capsules and tablets has also been formulated on the basis of the following materials.[80,109,189]

MATERIAL	PER CENT WEIGHT
Cholesterol	0.5-2 per cent
Myristic acid	44-88 per cent
Hydrogenated castor oil	5-45 per cent
Castor oil	1-3 per cent
Sodium Taurocholate	3-5 per cent

These ingredients are claimed to give a product resistance to gastric juices for more than ten hours.

Cholesterol is used as an emulsifying agent in the preparation of suppositories or other shaped medicaments, prepared with a plastic base consisting of an emulsion of a fat melting at body temperature with a glycerine-containing aqueous solution of gelatin, or a vegetable mucilage capable of setting to a jelly on cooling.

Cholesterol Derivatives

In reviewing some present and potential uses of cholesterol attention may first be concentrated on miscellaneous derivatives of the sterol compounds starting with organometalics.

In making alcoholates it has been found that the higher secondary alcohols react but slowly with some metals, e.g. sodium, and as a result, do not yield these derivatives readily, but a potassium-in-benzene "emulsion" has been employed successfully to this end in the case of cholesterol. Potassium cholesteroxide has also been prepared with the aid of potassium amyloxide. Related derivatives such as chloromercuric cholesterol have also been synthesized.[13,81]

Cholesterol carboxylic acid may be manufactured for further synthesis, by treating cholesterol chloride with diethyl carbonate and sodium in absolute alcohol, the product being saponified and the saponification product decomposed to give the acid.[50]

The sterolphosphoric acids, mono-cholesterylphosphoric acid m.p. 193° C., and di-cholesteryl-phosphoric acid, m.p. 204° C. have been described and also a p-cholesterylcarboxyphenylphosphoric acid.[172,173]

Interaction of phosphoryl chloride with cholesterol gives cholesteryl phosphate from which the barium, lead, silver, copper and sodium phosphates may be prepared. The same reagent has been used for the preparation of mono-cholesteryl phosphate dichloride and cholesteryl phosphate.[205]

Some cholesteryl pyridinium salts have been prepared via cholesteryl p-toluene-sulfonate and might prove of value as surface active materials. The properties of one or two of these preparations are as follows:[166]

SALT	M.P. °C.	$(\alpha)_D$
Cholesteryl pyridinium p-toluene-sulfonate	231	(a) 26/D −6.1($CHCl_3$)
Cholesteryl pyridinium iodide	260	(a) 27/D −7.4 "
Cholesteryl isothiuronium p-toluene-sulfonate	233	(a) 24/D −27.1(C_5H_5N)

The dehydration products of cholesterol include 2,4 cholestadiene, cholesterilene, dichloesteryl ether, a-cholesterylene and c-cholesterylene.[180] Cholesteryl formal melting at 139° C. has been prepared by adding sulfuric acid to an ether solution of cholesteryl in formaldehyde.[199]

Condensation products of cholesterol with aromatic amines have been obtained and the following properties are recorded.[201] Cholesterylamine has been prepared and melts at 98° C.[153]

DERIVATIVE	MELTING POINT °C.
Cholesterylaniline	189
Cholesteryl-o-toluidine	147
Cholesteryl-m-toluidine	147
Cholesteryl-p-toluidine	171
Cholesteryl-m-xylidine	153
Cholesterynapthylamine	141

The natural bile acid lithocholic acid has also been synthesized from cholesterol.[151]

Esters

Many useful esters of cholesterol have been prepared successfully and brief details are given for many of these in the list following. Some of these esters are of therapeutic value.[81] They form anisotropic liquids on melting, many having three stable liquid phases.

A general method of preparing the esters is described as follows: A mixture composed of 0.02 mole of the acid, 0.02 mole of the alcohol, 0.0015 mole of p-toluene-sulfonic acid and 150 cc. of anhydrous benzene, is placed in an apparatus with a suitable water trapping arrangement and refluxed for three hours in an oil bath, the temperature, maintained between 130-140° C.

The reaction mixture is allowed to cool, filtered, and the solvent then removed by heating under reduced pressure on the steam bath. The residue is washed with two or three 20-cc. portions of acetone, the latter removed by suction, and the crude ester recrystallized from a suitable solvent until the melting point is constant. Two recrystallizations are usually sufficient.[21]

The commercial production of the various cholesterol esters and derivatives include iodo-compounds intended for use in pharmacy as therapeutic agents and also as intermediates. These are produced in one process, by treating the hydroxy-compounds in the form of aryl or alkyl sulfonates, such as methanesulfonates or p-toluenesulfonate with sodium iodide.

Esters of good bactericidal action for use particularly in the treatment of lepra have been prepared by reacting cholesterol and chaulmoogric acid or similar acids, such esters being readily soluble in acetic acid esters and

ethyl ether. They are insoluble in water, but moderately soluble in alcohol and fatty oils. Esters of a similar nature have been prepared from phenylpropiolic acid chloride; crotonic acid chloride and benzylidene propionic acid chloride.[14] Betaine esters, dicholesteryl phosphates and cholesterol sodium sulfoacetates have all been used as anti-spattering agents in margarine.

Cholesterol forms loose compounds with fatty acids apart from the true stable esters.

Extensive details concerning the value of cholesteryl esters as supplementary emulsifying agents have appeared, and cholesteryl phosphate for example has been employed in ointment bases.[124]

Cholesteryl palmitate increases the absorption of the phenolsulfonphthalien dye from polyglycol ointment in a five per cent concentration.

The low melting point mixture (20° C.) of ethyl oleate and cholesteryl oleate, has been suggested for therapeutical purposes.[68] Oxygen absorption studies of solutions of cholesteryl oleate in peanut oil have been made.

Normal human serum contains enzymes which slowly esterify cholesterol in vitro.[53] Pancreatic juices and intestinal secretions can split cholesterol esters.

At a temperature of 37° C., cholesteryl stearate is soluble in olive oil to the extent of 3.35 per cent in castor oil to the extent of 0.26 per cent; in oleic acid 4.11 per cent, and in ricinoleic acid 0.33 per cent by weight. Apart from the acetate, cholesterol esters are only slightly soluble in alcohol.

Cholesteryl linoleate/linolenate mixtures have recently been indicated as particularly suitable additives for cosmetic preparations designed to act as emollients or the skin.[77]

Cholesteryl-B-bromoisovalerate described as having no taste and being insoluble in water, is hydrolyzed by aqueous alkalies and because of this is claimed to be of possible therapeutic value.[206]

The properties and preparation of various cholesteryl sulfates has been investigated and might be usefully mentioned at this point. Some of these are listed below with melting points.[167]

	MELTING POINT
Pyridinium cholesteryl sulfate	179° C.
Potassium cholesteryl sulfate	210° C.
Sodium cholesteryl sulfate	177° C.
Calcium cholesteryl sulfate	136° C.
Barium cholesteryl sulfate	124° C.
Magnesium cholesteryl sulfate	152° C.
Silver cholesteryl sulfate	124° C.
Lead cholesteryl sulfate	132° C.
Mercuric cholesteryl sulfate	152° C.
Copper cholesteryl sulfate	150° C.

Pyridium cholesteryl sulfate is a white solid which melts with decomposition at 179° C. Its specific rotation is (a) $20/D = -23.8°$ ($CHCl_3$). It is soluble in benzene, toluene, ether and fairly soluble in chloroform, pyridine, methanol, ethanol and acetone. It dissolves

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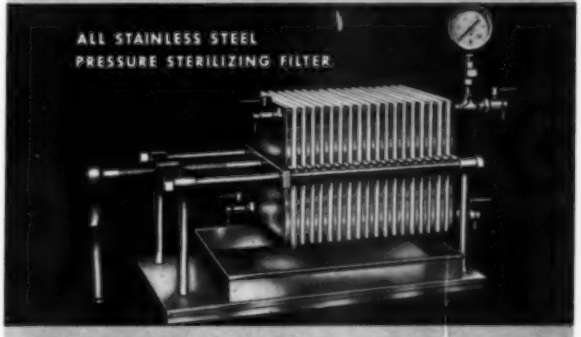

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in water to form a 10-15 per cent solution which may have valuable surface active properties and is colloidal in nature.

The material is stable to acids and alkalies at room temperature and to strong alkalies even at refluxing temperature. Salts of other metals may be easily prepared from the pyridium salt. Cholesteryl sulfite is stable to aqueous acid and alkaline solutions, but not to alcoholic potassium hydroxide solutions.[198]

Cholesteryl (diethylamino) acetate salts of penicillin G, melting at 104 – 7° C. have been prepared and claimed to maintain the therapeutic levels of penicillin in the blood for long periods of time, being used in wax-vegetable oil mediums for injection, or in tablet form for oral administration.[197] Cholesterol adipic acid ester isocyanate are claimed to be effective water-proofing agents.

CHOLESTEROL ESTERS, etc.

Ester	M.P. C.	Rotation	Reference
Arachidate	76	(a) 20/D—22.2	Biochem. Zt. 19, 24, *18*, 777.
Acetylsalicylate	105	——	Bull. Soc. Chem. 1931, *49*, 185[2].
Acetyl-glucoside	159	(a) 18/D—23.1	*242*, 210.
Abietate	122	——	J. Am. Chem. Soc. 1927, *49*, 2898.
Acetate	114	(a) 14/D—42.7	Z. Physik. Chem. 1906, *56*, 750.
Acetolactate	120	——	Biochem. Zt. 1930, *220*, 204.
Acetyricinoleate	30	——	Biochem. Zt. 1930, *220*, 204.
			Physik. Zt. 1906, *7*, 578.
Acetate-ozonide	—	——	Helv. Chim. Acta. 1946, *29*, 258.
			Monatsch Chem. *9*, 141.
Adipate	195	(a) 20/D—30.6	Biochem. Zt. 1930, *220*, 304.
p-Aminobenzoate	237	(a) 20/D—3.6	J. Biol. Chem. 1928, *80*, 1-8.
Allophanate	277	(a) 20/D—33.9	J. Biol. Chem. 1928, *80*, 1-8.
Bromide	103	(a) 20/D—28.67	Minikai 1941, *13*, 334.
			Monatsch Chem. 1912, *33*, 447.
Benzenesulfonate	138	(a) 19/D—39.6	Minikai 1941, *13*, 334,
Bromo-acetate	117	——	Bull. Soc. Chim. 1933. *53*, 370.
Butanetetracarboxylate	240	——	Zt. Physiol. Chem. 1932, *21*, 19.
O-benzoate	150	(a) 21/D—6.0	Svensk. Farm Tid. 1930, *34*, 457.
M-benzoate	141	(a) 21/D—11.9	Svensk. Farm Tid. 1930, *34*, 457.
p-benzoate	189	(a) 21/D—6.3	Svensk. Farm Tid. 1930, *34*, 457.
a-bromo-isovalerate	134	——	Z. Physiol. Chem. 1910, *65*, 69.
			G. P. 214157.
a-bromo-isohexoate	—	——	Z. Physiol. Chem. 1910, *65*, 69.
			G. P. 214157.
Butyrate	104	(a) 20/D—36.3	Z. Physiol. Chem. 1910, *65*, 69.
			G. P. 214157.
			Arch. Biochem. 1950, *26*, 331.
Betaine hydrochloride	230	——	U.S.P. 2429171.
			B.P. 366909.
Benzoate dichloride	250	(a) 25/D+13.4	J. Biol. Chem. 1946, *162*, 683.
Caproate	108	(a) 20/D—34.0	Biochem. Zt. 1930, *220*, 304.
Caprate	82	(a) 20/D—29.8	Biochem. Zt. 1930, *220*, 304.
Caprylate	107	——	Proc. K. Akad Wetesch 1906, *9*, 78.
Chaulmoograte	68	——	B.P. 408475.
Chloride dichloride	106	(a) 20/D—34.7	Gazz 1932, *62*, 63-80.
Chloride	95	(a) 20/D—27.4	Minikai 1941, *13*, 334.
Camphorate	133	——	Bull. Soc. Chim. 1928, *43*, 1403.
			J. Amer. Chem. Soc. 1929, *51*, 3665.
Citroconate	195	——	Bull. Soc. Chim. (Roumania), 1935, *17*, 177.
Creosotinate	158	——	Bull. Soc. Chim. 1931, *49*, 1852.
Camphorcarboxylate	178	——	Bull. Soc. Chim. 1931, *49*, 1852.
Carpinate	—	——	St. Physik. 1930, *61*, 386.
Cinnamate	151	——	Z. Physik. Chem. 1906, *56*, 750.
			Proc. K. Akad Wetesch 1906, *9*, 158.
Cerotate	73	(a) 20/D—5.3	Biochem. Zt. 1924, *18*, 777.
Crotonate	90	——	B.P. 243510.
Chloro-acetate	162	——	Ber. 1912, *45*, 2228.
			U.S.P. 2519112.
Decoate	—	——	Z. Physiol. Chem. 1906, *50*, 750.
			Physik. Zt., 1906, *7*, 578.
Disulfide	144	(a) 0/D—41.78	U.S.P. 1034161.
Dichloride	132	——	J. Biol. Chem. 1946, *162*, 683.
Dibromide	93	——	Zt. Physiol. Chem. 1921, *114*, 286.
Diethylamino-acetate salt of penicillin	104	——	J. Org. Chem. 1950, *15*, 35.
Dithiophosphate	—	——	Ber. 1941, *74B*, 1513.
Elsidate	47	(a) 20/D—20.8	Biochem. Zt. 1930, *220*, 304.
Euricate	44	(a) 20/D—20.8	Biochem. Zt. 1930, *220*, 304.
Fluoracetate	145	——	Nature 1946, *158*, 382.
			Rec. Trav. Chim. 1947, *66*, 413.
Fluorinate	96.8	(a) 15/D—52.5	Z. Physik. Chem. 1906, *56*, 750.
			Atti R. Accad. dei lincei 1903, *12*, 126.
Gynocardate	110	——	Bull. Soc. Chim. 1933, *53*, 370.
Glucoside	125	——	J. Amer. Chem. Assoc. 1950, *52*, 2512.
			Swiss Pat. 240457.
			Helv. Chim. Act., 1944, *27*, 231.
			U.S.P. 2479761.
Hydrochloride	154	——	Montasch 1906, *27*, 305.
Hydnocarpate	63	——	B.P. 408475.
Hexoate	153	——	B.P. 243510.
Heptylacetylglucoside	195	(a) 19/D—16.3	Z. Physiol. Chem. 1936, *242*, 210.
Heptylate	—	——	Rec. Trav. Chim. Paysbas 1907, *26*, 311.
Hippurate	153	(a) 25/D—43.0	J. Amer. Chem. Soc. 1930, *52*, 2512.
Iodide	103	(a) 20/D—11.94	B.P. 408475, 519277.
			Monatsch 1912, *3*, 447.
			J.C.S. 1936, 905.
Isobutyrate	125	(a) 20/D—37.9	S. Physiol. Chem. 1910, *62*, 69.
Isovalerate	125	(a) 20/D—32.7	Zt. Physiol. Chem. 1910, *65*, 69.
			Physiol. Zt. 1906, *7*, 578.
			Zt. Physik. Chem. 1906, *56*, 750.
Lactoside	260	——	Zt. Physiol. Chem. 1936, *242*, 210.
Laurate	79	(a) 20/D—32.7	J. Path. Bact. 1913-14.
			Rec. Trav. Chim. Paysbas 1907, *26*, 311.
			J. Amer. Pharm. Assoc. 1940, *29*, 14.
Lignocerate	87	(a) 20/D—18.5	Biochem. Zt. 1930, *229*, 304.
Linoleate	41	(a) 20/D—23.9	Bichem. Zt. 1930, *220*, 304.
Linolenate	49	(a) 20/D—24.3	Biochem. Zt. 1930, *220*, 304.
Myristate	71.5	(a) 20/D—26.6	Biochem. Zt. 1930, *220*, 304.
b-Naphthalate	168	(a) 20/D—0.0	Bull. Inst. Phys. Chem. Res. (Japan), 1936, *15*, 635.
Methane-sulfonate	120	(a) 23/D—35.7	B.P. 519277.
O-nitrobenzoate	149	(a) 21/D—6.0	Ber. 1930, *63B*, 1759.
m-nitrobenzoate	140	(a) 20/D—11.9	Ber. 1930, *63B*, 1759.
p-Nitrobenzoate	188	(a) 21/D—6.3	Ber. 1930, *63B*, 1759.
			Biol. Chem. 1928, *80*, 1-8.
Nitrate	81	——	Montasch. *28*, 1113.
Oleate	44	(a) 20/D—23.4	Biochem. Zt. 1930 *220*, 304 &
			Compt. Rend. 1948, *227*, 278.
Octoate	—	——	Zt. Physik. Chem. 1906, *56*, 750.
			Physik. St. 1906, *7*, 578.
Oxalate (mono)	69	(a) 20/D—32.5	Biochem. Zt. 1930, *220*, 304.
Oxalate (di)	220	(a) 20/D—25.8	Biochem. Zt. 1930, *220*, 304 &
Palmitate	80	(a) 20/D—24.2	Proc.K. Akad Wetesch 1906, *9*, 78.
			Zt. Physiol. Chem. 1910, *65*, 69.
			J. Amer. Pharm. Soc. 1940, *29*, 14.
Hydrogen Phthalate	199	——	J.C.S. 1936, *14*, 3.
Phthalate	164	(a) 19/D—8.4	Proc.K. Akad Wetesch 1906, *9*, 78.
			Zt. Physiol. Chem. 1890, *15*, 37.
			G.P. 567333 & 504825.
Propionate	98	(a) 20/D—40.9	Zt. Physik. Chem. 1906, *56*, 750.
			Zt. Physiol. Chem. 1890, *15*, 37.
Phenylurethane	168	(a) 20/D—28.19	Bull. Soc. Chem. 1904, *31*, 71.
Phosphate	—	——	J. Chem. Soc. 1929, 279.
			B.P. 366909.

Pyridylacetate	179	——	Ber. 1912, *45*, 2228.
Phosphite	158	(a) 22/D—19.25	J. Pharm. Soc. (Japan) 1928, *48*, 878. G.P. 514095.
D-quinovoside	253	(a) 20/D—63	Helv. Chim. Act. 1950, *33*, 456. G.P. 582266.
Ricinoleate	—	——	
Suberate	127	(a) 20/D—29.2	Biochem. Zt. 1930, *220*, 304.
Stearate	81	(a) 20/D—21.2	J. Path. Bact. 1913-14. Zt. Physiol. Chem. 1910, *65*, 69. Rec. Trav. Chem. Pays Bas 1907, *26*, 311. Proc. Akad. Wetesch 1906, *9*, 78. G.P. 582 26. J. Amer. Pharm. Soc. 1940, *29*, 14.
Succinate	178	(a) 20/D—41.1	Minikai 1941, *13*, 334. J. Amer. Phar. Assoc. 1944, *33*, 108. G.P. 504826.
Salicylate	180	(a) 15/D—52.7	Atti. R. Acad. Lincei. 1910, *19*, 782. Zt. Krist 1934, *89*, 427. Chem. Zt. 1907, *31*, 1215.
Sulfate	—	——	J. Chem. Soc. 1941, *63*, 6259.
Sulfo-acetate	—	——	U.S. Pat. 1917256 and 1917250. B.P. 366909.
Sulfite	178	——	Ber. 1931, *64B*, 1142. J. Amer. Chem. Soc. 1929, *51*, 3665.
Toluene-sulfonate	132	(a) 19/D—40.3	Minikai 1941, *19*, 334. J. Amer. Chem. Soc. 1948, *70*, 675.
Tetracetylglucoside	159	(a) 18/D—23.1	Ann. 1936, *448*, 128. Zt. Physiol. Chem. 1936, *242*, 210.
Tartarate	—	——	Biochem. Zt. 1930, *220*, 304. Compt. Rend. 1913, *156*, 149.
Tetrolate	115	——	B.P. 243510.
p-Toluene-sulphonate dichloride	190	(a) 17/D—6.1	J. Org. Chem. 1950, *15*, 35.
Triacetyl-B-D-quinovocide	171	(a) 20/D—11	Helv. Chim. Act. 1950, *33*, 456.
Thiochaulmoograte	67	(a) 20/D—9.28	Ber. 1941, *74B*, 27.
Thiohydrocarbate	63	(a) 20/D—10.71	Ber. 1941, *74B*, 27.
Thiocyanate	128	(a) 19/D—14.6	Rec. Trav. Chim. 1950, *69*, 904. Minikai 1941, *19*, 334. Ber. 1941, *18*, 334.
Urethane	212	——	Ber. *41*, 3051.
Undecanoate	79	(a) 20/D—28.3	Biochem. Zt. 1930, *220*, 304.
Valerate	92	(a) 20/D—34.0	Z. Physik. Chem. 1906, *56*, 750. Physik Zt. 1906, *7*, 578.
Zanthamide	227	——	Ann. 1910, *375*, 288.

The properties of some of the ethers of cholesterol are tabulated in the next table:

Ether	M.P. C.	Rotation	Reference
Allyl	78	(a) 20/D—32.8	J. Biol. Chem. 1927, *72*, 1012.
d-Bornyl	177	(a) 20/D—17.0	J. Biol. Chem. 1927, *72*, 1012.
Benzyl	118.5	(a) 20/D—26.32	Ber. 1911, *44*, 2847. J. Pr. Chem. 1911, *84*, 460.
Butyl	79	(a) 20/D—31.0	J. Biol. Chem. 1927, *72*, 1. Z. Physiol. Chem. 1890, *15*, 37.
p-Cresyl	154	(a) 20/D—32.9	J. Pr. Chem. 1911, *84*, 460.
Dicholesterol	194-203	(a) 14/D—43.9	J. Pharm. Soc. (Jap.) 1939, *59*, 418. J. Pharm. Soc. (Jap.) 1936, *56*, 697. J. Biol. Chem. 1936, *116*. J. Biol. Chem. 1927, *70*, 1012. B.P. 616495. U.S.P. 2520980.
Dicholesteryl formal	139	——	Bull. (IV) *47*, 467-469.
Ethyl	89	(a) 19/D—36.2	Ber. 1911, *44*, 2857. J. Biol. Chem. 1927, *72*, 1012.
n-Heptyl	96	(a) 20/D—25.6	J. Biol. Chem. 1927, *72*, 1012. J. Biol. Chem. 1933, *101*, 127.
n-Hexyl	79	(a) 20/D—26.0	J. Biol. Chem. 1927, *72*, 1012.
Isopropyl	132	(a) 20/D—31.1	J. Biol. Chem. 1927, *72*, 1012.
Isoamyl	94	(a) 20/D—28.4	J. Biol. Chem. 1927, *72*, 1012.
Isobutyl	113	(a) 20/D—28.7	J. Biol. Chem. 1927, *72*, 1012.
Methyl	84	(a) 20/D—38.8	J. Biol. Chem. 1933, *101*, 127. Zt. Physiol. Chem. 1932, *207*, 147.

(Continued on page 300)

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(*Continued from page 299*)

p-Methylbenzyl	129	(a) 20/D—26.32	Zt. Physiol. Chem. 1932, *207*, 147.
m-Methylbenzyl	93	(a) 20/D—31.76	Zt. Physiol. Chem. 1932, *207*, 147.
Nicotinate	152	(a) 20/D—16.2	U.S.P. 2586438.
Sec-Octyl	90	(a) 20/D—24.8	J. Biol. Chem. 1926,
n-Octyl	—	——	B.P. 614194.
Phenyl	157.5	(a) 20/D—34.89	J. Pr. Chem. 1911, *84*, 460.
n-Propyl	99.5	(a) 20/D—31.0	Ber. 1911, *44*, 2847.
p-Tolyl	154.5	(a) 21/D—32.95	J. Pr. Chem. 1911, *84*, 460.
Trityl	137.5	——	U.S.P. 2286636.
Tetrahydrofurfuryl	142	(a) 20/D—33	Bull. (IV) *47*, 93-95.

There is considerable reference in the literature on wool wax alcohols which are rich in cholesterol, to a product designated "oxycholesterol," and reported to be an especially effective water-in-oil emulsifying agent.[171]

This material appears actually to consist of one or more of the hydroxy-cholesterols which are possible, and although the earlier material was always prepared from wool wax alcohols, a synthetic product appeared later produced by the benzoyl peroxide oxidation of cholesterol.

The material may be prepared by dissolving two parts of cholesterol in 100 volumes of chloroform and mixing into this two parts of benzoyl peroxide, followed by boiling under reflux for eight to 10 hours, when the solvent may be removed by distillation and the residue refined by saponification and extraction with methanol.[170]

Oxidation of cholesterol with hydrogen peroxide gives cholestametriol, M.P. 239° C.[168]

Such a product is claimed as an efficient base for many cosmetic preparations, a basic formulation for which is as follows:

Oxidized Cholesterol	7	parts weight
Soft Paraffin	693	" "
Water	300	" "

—while other typical formulations are given in the table at the bottom of this page.

It is claimed that a large variety of materials may be incorporated in oxidized cholesterol creams without loss of stability, including tannic acids and heavy metal salts, glycerol, etc., and that these creams have been found particularly suitable as the basic materials for creams of an acid nature such as astringent creams and some cleansing and bleaching creams. It is not usually possible to incorporate into ordinary cosmetic emulsions materials such as acid natural fruit juices, but this can be done with oxidized cholesterol emulsions, as follows:

Five parts of oxidized cholesterol and ninety-five parts of soft paraffin are mixed. Twenty parts of soft paraffin and three parts beeswax are melted together. Thirty parts of the first mixture are added with thorough stirring, followed by fifty parts of natural lemon juice while still hot and the whole stirred until cold.

In the capacity of a "skin penetrant" oxidized cholesterol has very recently been utilized in the preparation of a liquid cosmetic make-up foundation intended to be applied to the skin prior to application of powder or rouge, e.g. on the fifth formula in table below.

A nasal medicament has been described which consists of w/o emulsion of water and oxidized cholesterol, having a water soluble medicament dissolved therein. One hundred cc. of distilled water containing one cc. hydrochloric acid—(claimed to act as a deflocculating agent towards the sterol and, as a result of this, as a stabilizer for the emulsion)—are used to dissolve 2.5 grams phenol, 3.5 grams of a butyl oxycinchoninic acid diethylenethyleneanide hydrochloric—2 grams of oxyquinoline sulfate are then stirred with the solution.

When these chemicals are dissolved, 150 grams of

COSMETIC	NIGHT CREAM	HAIR CREAM	HAND CREAM	SKIN CREAM	LIQUID MAKE-UP FOUNDATION	SUNBURN CREAM
Oxidized cholesterol	0.5	2	0.3	0.74	2	5
Lecithin	0.5	—	—	—	—	—
Stearyl Alcohol	5.0	1	0.25	—	—	—
Lanolin	6.0	—	—	—	—	—
Protective Agent	—	—	—	—	—	5
Lard	16.0	—	—	—	—	—
Vegetable Oil	18.0	—	2.5	—	64	25
Petroleum Jelly	28.0	—	—	74	—	—
Water	30	50	78	22	—	40
Liquid Paraffin	—	17	—	—	—	30
Albumol	—	2	—	—	—	—
Stearic acid	—	—	1.5	2	—	—
Triethanolamine	—	—	0.5	0.9	—	—
Glycerol	—	—	6.0	—	—	—
Alcohol	—	—	6.0	—	—	—
Zinx Oxide	—	—	—	—	11	—
Titanium dioxide	—	—	—	—	16	—
Glyceryl mono-stearate	—	—	—	—	1	—

glycerine and 250 grams of ethylene glycol are added and the solution heated to 125° F. The oxidized sterol is melted and to this is added with stirring 15 grams menthol, 30 grams chlorbutanol and 10 grams hexylresorcinol.

The mixing is then done in a glass lined mixing device, preferably of a vacuum type, the aqueous solution being added slowly while the mixing is in operation. The result is a thick creamy substance.

This description has been given in detail partly to demonstrate the type of additions these cholesterol emulsions are able to accommodate. These sterol emulsions are stated to be compatible with and able to spread over the mucous membrane forming an emulsion with the mucus.

Pyrolysis Products

Cholesterol undergoes certain changes if heated to high temperature, giving various derivatives such as cholesterone, dihydrochlesterol and epi-allo-cholesterol, all obtained by heating the cholesterol for 30 minutes at 310° C.[178]

Heating with dehydrating agents gives rise to dicholesteryl ether and 2,4- and 3,5- cholestadiene, the latter being also obtained by heating cholesterol phosphate. Methyl isohexyl ketone and hydrocarbon $C_{18}H_{16}$ are obtained if the sterol is heated to 430° C.

By passing cholesterol vapor over heated platinum wire at 250° C. and at 11 mm., a mixture containing hydrocarbons $C_{16}H_{12}$–$C_{18}H_{14}$ is obtained.[179] Cholesteryl oleate distillation gives above 50 per cent cholesterylene.

Some of the pyrolysis derivatives may be carcinogenic.

Sulfur Derivatives

There is an interest in certain sulfur-containing derivatives of cholesterol other than the sulfuric acid esters. In hair treatment a sulfur-cholesterol compound has been utilized as illustrated earlier, and it is of value to note that similar preparations have been utilized for the production of oils and ointments absorbing ultraviolet light as sunburn protectives.[175]

Thiocholesterol has attracted attention as an intermediate and as a substance having metabolic properties and being capable of absorption by the skin.[176] One product with the ascribed formulation $C_{27}H_{45}SH$, M.P. 191, (a) 20/D = –39° C. has been prepared by treatment of cholesterol by refluxing it together with phosphorous pentasulfide in carbon disulfide, alternatively the sulfur and cholesterol may be heated directly together.

Cholesterol-S-pseudo-hydrobromides have proven of interest as intermediates in the making of therapeutically active preparations and have been produced by reaction of cholesteryl bromide with thiourea in isopropanol.[177] Such a product which is somewhat soluble in warm isopropanol but insoluble in water, ether, benzene, etc., melts at 250-252° C. *(To be concluded)*

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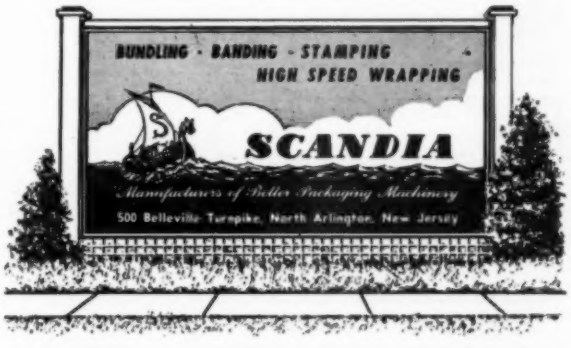
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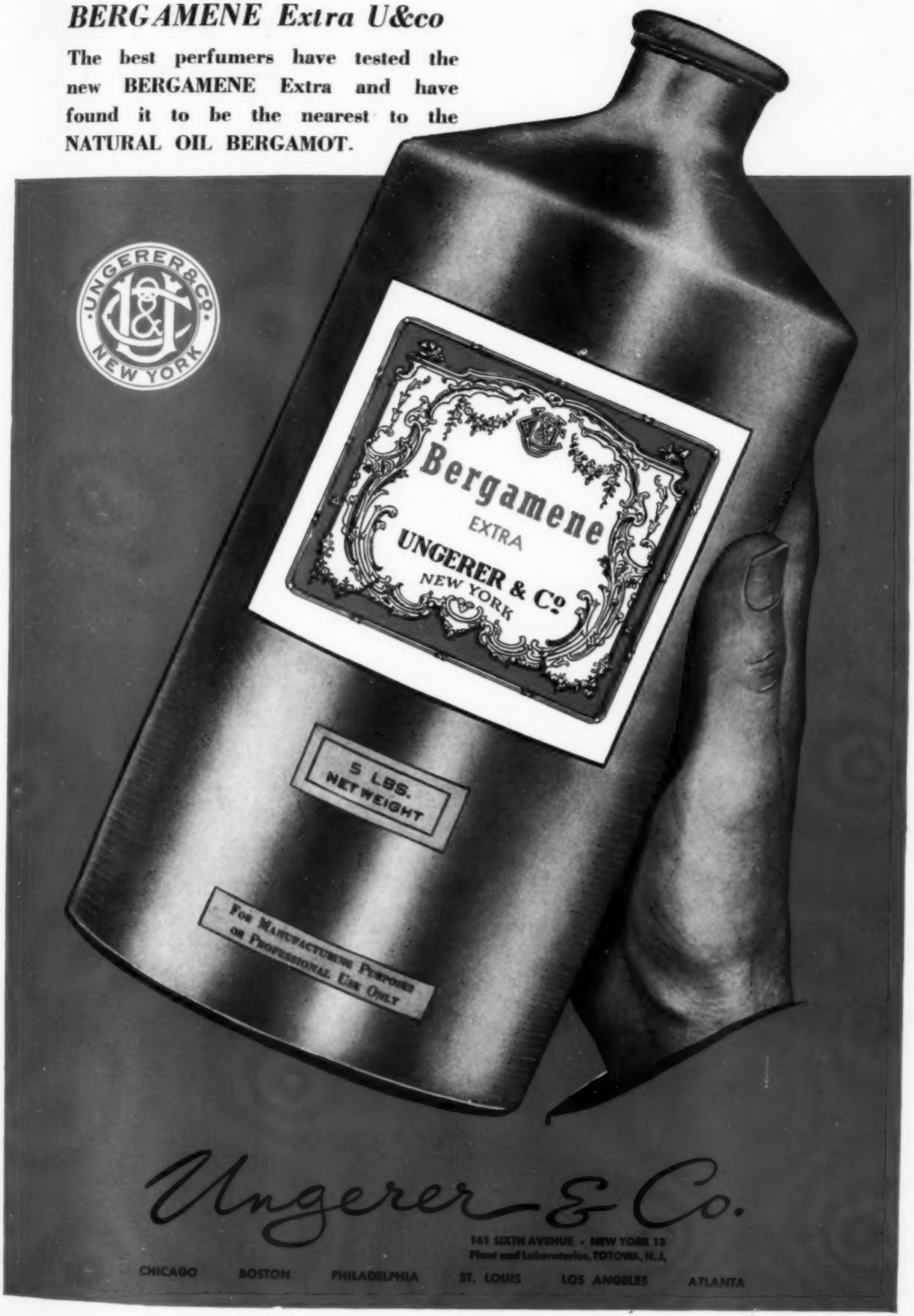

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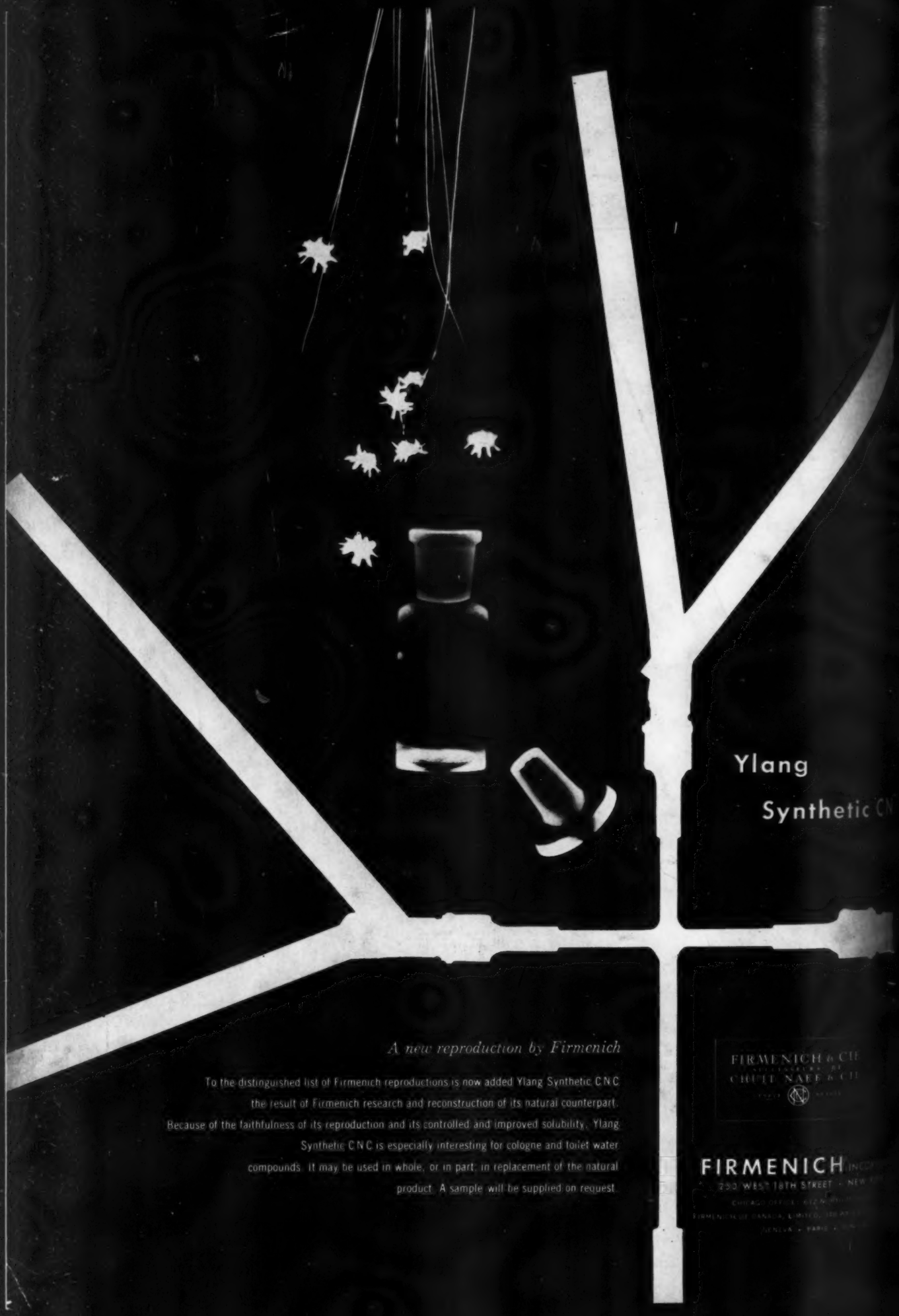

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